

**The Psychology of Environmental Activism: The Role of Responsibility and
Distance Framings**

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Declaration

The research reported in this thesis is my own work, except for where indicated.

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Abstract

Environmental activism and climate change engagement have been the focus of much recent research, paralleling the looming climate crisis which is an existential threat faced by humanity. Previous studies utilised different frames to motivate pro-environmental intentions and behaviour, but collective environmental action has not been examined to the same extent. The thesis begins with a review of theories and evidence about environmental activism in general, followed by a more focussed review of the role of psychological distance. Although past research presented theoretical models of environmental activism, some of the key determinants of pro-environmentalism were yet to be examined in these frameworks, such as moral foundations, sense of responsibility, and psychological distance. In order to address these gaps in previous literature the present thesis used four experiments with British participants to investigate how various framings could motivate environmental activism. Across four experiments (Studies 1-4) integrated collective action models were also tested. Specifically, Study 1 examined the effect of ingroup and outgroup responsibility for environmental degradation on activism intentions. Highlighting ingroup responsibility did not lead to changes in activism intentions whereas some evidence for moral defensiveness was found. Studies 2 and 3 compared proximal and distal framings of climate change impacts in determining climate activism intentions. The results provided weak evidence about the interaction of distance framings by political ideology such that right-wing ideology was linked to either dismissiveness or boomerang effect in response to proximal framings. Study 4 tested whether presenting air pollution frame is more effective than climate change frame in diminishing political polarisation collective action variables and reducing psychological distance. The results did not fully replicate prior studies and showed that air pollution frame was equally effective in motivating environmental activism among conservatives on outcomes except for perceived distance. The results are discussed in light of sample characteristics and the cross-

cultural differences in boomerang effects concerning climate change communication. The integrated path model failed to provide a good fit across Studies 1-4 as well as across different experimental conditions although model tests revealed consistent connections between certain variables. Support for system reform and participative efficacy were distal and proximal predictors of activism intentions, whereas the effect of collective emotions was not as prominent and differed across studies.

Chapter 1: Antecedents of Pro-Environmental Attitudes and Behaviour

1.1 Chapter Overview

Deterioration of natural resources at an alarming rate, and a growing consensus about a looming climate crisis reveal that environmental problems are likely to be a significant challenge for the near future. Psychological research has been examining the ways to promote more sustainable and environmentally friendly behaviour and address determinants of pro-environmental attitudes and behaviour. A large number of studies utilised several behavioural and attitudinal models, as well as collective action frameworks to explain various forms of pro-environmental engagement (Bamberg et al., 2015; Morren & Grinstein, 2016; Steg et al., 2014). The present chapter will summarise the factors that are influential in determining pro-environmental behaviours and attitudes. In this literature review, the individual, contextual and group-based variables, and their relationship to pro-environmental behaviours will be examined. Some of these variables presented in this review do not feature in the subsequent empirical chapters. However, because a significant body of research indicates their role as prominent drivers of pro-environmental behaviour (PEB), they fall within the scope of the review to establish a comprehensive understanding of environmentalism.

In the following sections, firstly the role of individual variables on environmentalism will be examined. These include personal values and moral foundations, political orientation, environmental concern, and perceived responsibility of environmental degradation. Then within the context of collective action frameworks, the role of collective variables, i.e., social identity, group-based/participative efficacy and collective emotions will be described. Then, a multidimensional approach to PEB and distinctions between individual and collective dimensions will be presented.

Finally, environmental activism, which is the main outcome in the empirical studies in the following chapters, will be examined as a distinct form of PEB.

1.2 Classifying Pro-Environmental Behaviour

Past literature identified 4 components of PEB; environmental citizenship, policy support (public-sphere non-activist behaviour), environmental activism and consumer behaviour (Dietz et al., 1998; Lee et al., 2014; Stern et al., 1999). Public sphere non-activist behaviour includes policy support, e.g., paying green taxes or endorsement of green legislation. Environmental citizenship refers to actions such as petition signing for a pro-environmental cause or showing support for a pro-environmental group (Stern, 2000). Lastly, environmental activism consists of membership to and activity within environmental groups, as well as engagement in political action (Dono et al., 2010). Depending on its impacts on the ecosystem, environmentally significant behaviour can be either direct or indirect (Stern, 2000). An additional fifth cluster of PEB is organizational level PEB, which is comprised of industrial activities that have a large scale impact on the environment (Stern, 2000).

1.3 Personal Determinants of PEB

1.3.1. Value Orientations

Values are considered as psychological constructs that are relatively stable (Feather, 1995). Research revealed that values predict wide range of behaviours and attitudes (Barker & Rokeach, 1975). Past evidence identified the role of several value orientations in the environmental domain. These include egoistic values; placing importance on the personal outcomes, social altruistic values; concern over outcomes for other people, and biospheric values; considerations on the well-being of the natural environment (Stern & Dietz, 1994). Among these, biospheric and social altruistic (vs. egoistic) values appear as predictors of higher (vs. lower) perceived environmental risk and political PEB intentions (Stern & Dietz, 1994). Biospheric values were also positively related to “eco-innovation adoption”, i.e.,

willingness to use alternative-fuel cars (Jansson et al., 2010). Socially-oriented value orientations such as conformity also predict higher frequency of PEB, e.g. mindful consumption of water (Pinto et al., 2011). Biospheric values more consistently predict environmentalism than social altruistic values, despite moderate correlation between the two. For example, a study conducted among 5 EU countries revealed that biospheric, but not social altruistic values explained a large amount of variance in environmental risk perception and personal norms for PEB (De Groot & Steg, 2007).

Past literature focusing on other value dimensions reached similar conclusions. Self-transcendental values, which pertains to shifting focus from the self to higher ideals and goals, were positively related to moral norms about pro-environmentalism whereas traditional values, which emphasize security, importance of family, kinship and loyalty were negatively related to it (Stern et al., 1999). Similar to biospheric concerns, self-transcendental values predicted higher frequency of self-reported PEB, e.g., recharging batteries and signing a petition for an environmental cause. In contrast, similar to egoistic concerns, self-enhancement, i.e., motivation to promote self-direction and achievement, and tolerance did not (Jia et al., 2017). In line with this, narratives of environmental activists usually emphasise self-transcendental values such as care and concern for the natural life, whereas counter-activists downplay these motivations and instead focus on growth and achievement as main objectives (Jia et al., 2017).

Individualistic values were associated with higher climate change scepticism and lower environmental concern, whereas egalitarianism was positively linked to environmental concern (Kahan et al., 2012). Materialistic values, which is highly linked to consumerism culture in most Western societies, were negatively linked to environmental concern (Kilbourne & Pickett, 2008).

In sum, research documented higher environmental concern and PEB among those with stronger self-transcendental and biospheric values. Nevertheless, the link between values and PEB were mediated by various beliefs, such as perceived responsibility in environmental degradation and awareness of serious consequences. Theoretical models, such as Value-Belief-Norm (VBN) model, highlighted the significance of beliefs in determining the adoption of PEB.

1.3.2 VBN Model: Values, Beliefs, and Norms in PEB

According to the norm activation model of Schwartz (1977), altruism can be motivated by value orientation if people have strong beliefs in the future consequences of inaction and personal responsibility. Specifically, ascription of individual responsibility (AR), awareness of adverse consequences of inaction (AC), and belief in self-efficacy should be present for prosocial behaviour to occur (Schwartz, 1977).

These components, later redefined in the environmental context as “environmental beliefs”, refer to convictions about human responsibility in environmental degradation, adverse consequences of human actions towards nature, and perceived ability (self-efficacy) to prevent environmental damage (Stern et al., 1999). Norm activation theory was used to explain private-sphere (i.e. littering and recycling) and politically significant public-sphere environmental behaviours (petition signing, voting for the Green Party) (Turaga et al., 2010).

The Value-Belief-Norm (VBN) model, developed from norm activation theory, posits that values (biospheric, egoistic, social-altruistic) activate AC and AR (environmental beliefs), and personal moral norms, which then motivate PEB (Stern et al., 1999). The VBN model suggests that environmental beliefs, and personal moral norms are linked to relatively stable value orientations and less likely to be modified with new information. The VBN model has proved a successful framework for

explaining PEB (Steg et al., 2005). For example, Lee et al. (2014) showed that environmental risk perceptions (AC) mediated the link between altruistic and biospheric value orientations and various PEB intentions among a South Korean sample. The lack of direct effect between values and PEB support distal role of values in determining PEB (Lee et al., 2014).

Contemporary environmentalist beliefs about AC, AR and efficacy are encapsulated within the New Environmental Paradigm (NEP), which includes beliefs related to the scarcity/fragility of the natural resources and human responsibility in environmental degradation (Dunlap et al., 2000). NEP scale thus measured the degree of endorsement of these beliefs, and greater concern about environmental issues. Higher scores on NEP predicted higher engagement in a range of pro-environmental behaviours (Davis et al., 2009; Steg & Vlek, 2009). However, a significant body of research studies have used NEP scale as a proxy for different constructs such as “risk perceptions”, “environmental beliefs”, and “environmental concern”, causing conceptual ambiguity. We choose to use “environmental concern” throughout this review.

1.3.3 Values as Moderators

Past research revealed that people tend to evaluate new information through the lens of their individual value system (Kahan, 2010). Hence, values were shown to moderate the effect of environmental messages and PEB/attitudes. Specifically, watching movie clips about negative impacts of plastic use led to greater acceptance of policies and behavioural intentions to reduce plastic use and waste, but only for those with strong biospheric values (Bolderdijk et al., 2013). However, the same effect was not observed for the AC, efficacy, and moral norms. Authors concluded that the latter group of variables was closely linked to biospheric values system, which are robust and

difficult to manipulate (Bolderdijk et al., 2013). This supports the finding that environmental beliefs and value orientations had significant correlations (Stern & Dietz, 1994).

Research also addressed constructs that are conceptually similar to biospheric value orientation. For example, environmental self-identity, i.e., one's self-perception as a pro-environmental mediates the link between biospheric values and pro-environmental behaviour intentions and actual behaviour (Van der Werff et al., 2013). Also, environmental self-identity predicted shopping preferences, water use, and waste production in a way that would reduce the harm to the environment (Whitmarsh & O'Neill, 2010). Feeling connected to nature, which is linked to expansion of self to include non-human entities, was positively linked to PEB and environmental concern (Gosling & Williams, 2010).

In addition to VBN model, Theory of Planned Behaviour (TPB) is also used to explain pro-environmental behaviour in various settings. TPB (Ajzen, 1991) posits that behaviours are primarily determined by intentions, which are preceded by attitudes towards the behaviours, social norms, and self-efficacy. TPB is successfully applied to explain various pro-environmental behaviours such as energy saving, travelling, and recycling (Bamberg & Möser, 2007; Morren & Grinstein, 2016). TPB variables also predicted 30% variability in environmental activism intentions (Fielding et al., 2008). Research also integrated social identity approach to TPB to highlight the role of group membership in determining the effect of social norms on pro-environmental behaviour (Fielding & Hornsey, 2016).

1.4 Political Views

Left-wing political views are positively associated with higher levels of pro-environmental behaviour, environmental concern and politically significant

environmental actions especially in the US (Dunlap, 2013; Feygina et al., 2010). Environmental issues, especially climate change, are highly polarised across the political spectrum in the US. Specifically, McCright et al. (2013) found that right-wing political ideology and party identification strongly predicted lower perceived scientific agreement on climate change, which predicted lower support for mitigation strategies (e.g., regulating carbon emissions for industry and households). This effect was mediated by time and human causality and timing of climate change impacts. Additional research suggested that this polarisation is attributed to social identity formation through opinion groups. For example, Bliuc et al. (2015) revealed that identification with the group of climate change believers or sceptics was an important driver of pro-environmental behaviour among American citizens, and it was suggested that these identities are not reducible to political ideology and demographic characteristics, emphasizing the importance of the identity and group-based dimensions of climate change. Hence, climate change perceptions should be examined within the framework of intergroup relations.

1.4.1 SDO, RWA, and System Justification

Right-wing authoritarianism (RWA) and Social-Dominance Orientation (SDO) are two main personality traits, later conceptualized as ideological positions, which were shown to predict a wide range of prejudicial attitudes including prejudice towards ethnic outgroups, and sexism (Duckitt & Sibley, 2007, 2009) as well as political orientation and nationalism (Pratto, 1999). RWA pertains to motivation to maintain order and cohesion in the society, protection of traditional values, and support for leaders who bolster these values (Duckitt & Sibley, 2010). Right-wing authoritarianism (RWA) has three main components, namely, conventionalism, aggression, and submission to authority as defined by Altemeyer (2004). Authoritarian personality is

positively associated with right-wing political orientation (Stone & Smith, 1993).

Authoritarianism indicates high respect for the values of the leaders in multiple domains of the society, which explains their endorsement of the dominant worldviews favouring economic growth and productivity (Schultz & Stone, 1994). People high in RWA also showed greater prejudice towards immigrants due to the higher perceived threat to social order and stability from immigrants (Duckitt, 2001). The SDO scale was developed to measure one's beliefs concerning intergroup relations and power distribution in the society. Social dominance orientation (SDO) relates to a worldview where resources are scarce, competition is ever present, and power hierarchies are emphasised. SDO was shown to be positively linked to prejudicial attitudes towards low-status outgroups, acceptance of social inequality and support for ingroup domination over the outgroups (Duckitt, 2001).

1.4.2 RWA and SDO as Distinct Constructs

Dual process model of prejudicial attitudes by Duckitt (2001) proposed that RWA and SDO were shown to have distinct motivational antecedents although they are positively related. Indeed, conservatism has two-dimensions, each pertaining to views on the acceptability of social change and social inequality, and both were linked to lower levels of intolerance of ambiguity (Jost et al., 2003).

A study using a large pool of participants composed of 14 different samples from New Zealand found political conservatism to be positively related to both RWA and less strongly to SDO (Wilson & Sibley, 2013). Research also documented additive, rather than interactive effects of RWA and SDO on prejudicial attitudes. Among 16 different samples in New Zealand, the interactive effects of RWA and SDO on various forms of prejudice (e.g. ethnic prejudice and sexism) ranged from very small to nonsignificant (Sibley et al., 2006). Moreover, it was shown that the positive

relationship between RWA and SDO was not observed among Eastern European countries (Van Hiel & Kossowska, 2007). Research documented that although generalized prejudice is associated with both RWA and SDO, these motivations seem to be distinct. RWA was primarily linked to negative evaluation of “dangerous groups”, e.g., drug dealers and terrorists which are perceived as a threat to the existing social order whereas SDO predicted unfavourable attitudes towards “derogated” groups, e.g., unemployed, and immigrants, which were motivated by competitive needs to justify lower status of those groups (Duckitt & Sibley, 2007).

1.4.3 RWA, SDO and Environmentalism

Past research focussed extensively on the link between RWA, SDO and environmentalism. People high in authoritarianism have high respect for the values of the leaders concerning multiple aspects of the functioning of society, hence they highly endorse the dominant worldviews favouring constant economic growth and productivity. Schultz and Stone (1994) showed that US participants who scored higher on authoritarianism showed more support for the building of a power plant by a local river, exhibited less concern for the environment, and showed less support for punitive measures against pollution. Similarly, American participants high in SDO exhibited lower support for the environmental policies and viewed environmental issues through the lens of a nationalistic viewpoint. Specifically, they legitimised the sanctions against Iraq during Gulf War because of the environmental pollution by Iraqi government’s oil burning (Pratto et al., 1994).

Similarly, recent research revealed that SDO was negatively linked to environmental concern and belief in human-caused climate change (Milfont & Sibley, 2014). Stanley et al. (2019) assessed the link between RWA, SDO and environmentalism in a 5-year longitudinal study and found that past RWA and SDO predicted lower future environmental concern. Interestingly, willingness to sacrifice for

the environment, was found to negatively predict SDO over time. Hence, those who were less willing to make lifestyle changes for the environment tended to favour an inherent inequality between social groups more over time (Milfont et al., 2019).

Authors argued that environmentalism is a “hierarchy attenuating” worldview which attempts to minimise the differences between high and low status groups, particularly in terms of the exposure to environmental hazards.

1.4.4 System Justification and Environmentalism

According to system justification theory people tend to support and approve of the existing socio-economic order and organizations driven by their need to reduce uncertainty and perceptions of threat (Jost & Hunyady, 2005). There are multiple dimensions of system justifying ideologies. The economic aspect, i.e., neoliberalism, pertains to legitimisation of free-market ideas, whereas the social aspect, i.e., political conservatism, relates to favouring protection of traditional values and worldviews (Jost & Hunyady, 2005). Among American participants, system justification was positively associated with more favourable perceptions of the ingroup for the advantaged and ethnic majority group members (e.g., Whites) whereas for the minorities it predicted more favourable perceptions of the outgroup (Jost et al., 2004). Adoption of system justification beliefs is argued to perpetuate the inequality and injustice embedded in the current socioeconomic organisation (Jost et al., 2003).

McCright and Dunlap (2003) indicate that large-scale societal change is needed to counteract environmental problems such as climate change, contradicting the status quo and current socioeconomic order, which are endorsed by public and especially the conservative elite. They suggested that materialistic values are deeply ingrained within the economic institutions and consumer behaviour among most Western countries which accelerate environmental degradation (Kilbourne & Pickett, 2008). Therefore, a

reformation of the current socioeconomic order is necessary to mitigate environmental problems at a large scale. For instance, considering its impacts and proposed solutions, global environmental problems such as climate change threaten current economic infrastructure. The idea of a major reform to the present socioeconomic system, primarily production and consumption cycles could lead to defensive attitudes, or indifference towards environmental problems especially with people high in system justifying tendencies and higher in political conservatism (Feygina et al., 2010). The negative relationship between right-wing political ideology/conservatism and national identification with pro-environmental behaviour may partly be explained by the positive link between system justification and right-wing ideology. Indeed, (Feygina, 2012) showed that political ideology and national identification predicted general and economic system justification which in turn predicted greater denial of environmental problems and lower pro-environmental behaviour intentions. Similarly, (Feinberg & Willer, 2011) showed that people high in Just World Beliefs, i.e., the belief that the world is a just and orderly place, held lower pro-environmental action intentions, and this relationship was mediated by climate change scepticism. Moreover, priming participants with just-world beliefs also increased their levels of scepticism and decreased willingness to engage in behaviours that result in less carbon footprint (Feinberg & Willer, 2011). (Jylhä & Akrami, 2015) (2015) showed that system justification led to denial of human impact on and seriousness of climate change through higher social dominance orientation and environmental concern.

1.4.5 Remarks on Political Ideology

The positive relationship between right-wing ideological attitudes and environmentalism may not apply to all countries and cultures at the same level. McCright and colleagues (2016) found that being on the political left predicted greater

belief in the seriousness of and human causality in climate change, as well as pro-environmental intentions and actions for citizens of Western European countries but not that of Eastern European countries. They showed that among 14 Western European countries citizens on the left side of the political spectrum consistently reported stronger belief in climate change and support for mitigation actions compared to citizens on the right. Ideological gap was not observed for Eastern European countries, which was possibly due to the low political salience of climate change and the different conceptualization of political identification in these countries (McCright et al., 2016).

In addition, political orientation may not capture the same set of worldviews across countries. For instance, British conservatism strongly emphasise responsibility towards next generations and protection of natural heritage, arguably fostering environmentalism. It could also be the case that environmentalist views are connected to political conservatism with a different set of priorities and values than liberalism. For example, Whitmarsh and Corner (2017) assessed the link between political ideology and environmentalism in the British context with a survey and focus groups. Quantitative results showed that left-wing ideology was associated with higher perceived climate change risk, green policy support, and PEB intentions. However, across the political spectrum there was a general agreement on need for waste reduction and building British-based national renewable energy technologies. Focus groups revealed that politically conservative participants brought up topics of waste and frugality with resources frequently, resonating with responsibility aspect of conservatism as well as pro-environmental goals. More importantly, local initiatives and decision-making found wide range support, such as planning of renewable energy at the neighbourhood level. However, framing environmentalism to “promote a good life” was not strongly endorsed by conservatives, due to its more “liberal” connotations.

Finally, promoting renewable energy as a way of making a profitable business was not supported and evaluated as “insincere” by most participants (Whitmarsh & Corner, 2017). Research also suggests that the way environmental messages are framed may impact the endorsement of pro-environmental intentions. Specifically, when environmentalist movement is described in line with patriotic values, high system justifiers` intention to act pro-environmentally increased, but not that of low systems justifiers. Hence, when environmentalist messages were presented as compatible with system-preserving values, system justification tendencies no longer predicted pro-environmental behaviours or intentions (Feygina et al., 2010).

In sum, the prevalence of environmental concern among conservatives might be expressed and represented differently than liberals, and in relation to a different set of principles or values (frugality, national independence etc.). Appealing to these principles when framing environmental issues and solutions could ameliorate political polarisation and provide a common ground. Thus, environmental messages can be rendered more effective by deriving responsibility or moral obligations from already existing and strongly held social identities, political ideologies, and commonly held goals. The next section describes the evidence on the effectiveness of alternative framings on improving environmental engagement.

1.5 Framing Climate Change

Highlighting the non-political aspects of environmentalism would also remove focus from the clash between supporters and sceptics of climate change, hence the opposition between conservatives and liberals. For example, since political views tend to polarize citizens on climate change in most Western countries and predominantly in the US, research examined the role of highlighting side benefits as an alternative way of framing environmental issues. For example, underlining the “public health benefits” of

pro-environmental actions proved equally effective in eliciting policy support from both conservative and liberal US participants, hence reducing the attitude gap (Maibach et al., 2010).

However, research also indicates that consistently emphasizing external benefits, especially material ones, may diminish the power of intrinsic motivations and values that promote environmental engagement. Therefore, mentioning side benefits of pro-environmental actions may hinder long-term and sustained action (Markowitz & Shariff, 2012). Some research found that moral framings and economic incentives in combination could motivate pro-environmental behaviour. In an experimental field study, Hunecke et al. (2001) showed that highest preference for public transport was observed when it was free and for participants with higher environmental concern. This suggests that economic incentives could complement moral norms for pro-environmentalism (See Chapter 3 for a more detailed discussion on alternative framings of environmental issues).

1.6 Morality and Environmentalism

Individuals tend to perceive moral convictions as unquestionable facts rather than personal opinions (Skitka et al., 2005). Moralisation of an issue motivates individuals to act according to moral norms. For instance, people who perceive their right to obtain knowledge about products as a moral issue were more likely to have collective action intentions against GMO (van Zomeren et al., 2012). In the environmental domain, a comprehensive review found that in developed countries recycling behaviour was motivated by moral convictions rather than cost-benefit analysis (Thøgersen, 1996). Moral judgments are among the key motivators of pro-environmental behaviour, especially those that are costly (Hage et al., 2009). Similarly, willingness to adopt eco-friendly vehicle alternatives were predicted more strongly by

moral norms than by value orientations (Jansson et al., 2010). Also, environmental groups emphasize protection of the environment mostly as a moral responsibility (Täuber et al., 2015).

1.6.1 Moral Disengagement from Environmental Problems: Climate Change

Past research highlighted possible reasons why beliefs related to human responsibility and impact on the environment, i.e., moral obligation, may not be acknowledged in the first place. For instance, climate change is perceived as a relatively intangible and distant threat, associated with a complex set of assumptions, which may lead to increased psychological distance from the issue, unrealistic optimism and inaction (Maiella et al., 2020). For climate change, it is difficult to form a direct causal link between human conduct and environmental degradation, therefore moral intuitions may not be activated (Markowitz & Shariff, 2012). Therefore, presenting impacts as happening here and now might increase concern for the environment. Indeed, experiencing global warming impacts was associated with positive attitudes towards green politics. Particularly, university students' perception of environmental risk and implicit preference for the green politician increased after they experienced hurricane Sandy (Rudman et al., 2013). Another reason for moral disengagement might be decreased efficacy beliefs decrease and hopelessness in the face of high-level threat (Tauber, Zomeran, & Kutlaca, 2015). Therefore, adopting a non-moral discourse in promoting pro-environmental intentions, i.e., focussing on efficacy and solutions, may be more effective than moral framing (Tauber & Zomeran, 2013).

There is evidence that moral disengagement is more common for those with lower environmental concern. Specifically, for those who endorsed materialistic values, presenting adverse impacts of consumer behaviour and highlighted individual responsibility resulted in greater disbelief in environmental degradation (Kilbourne &

Pickett, 2008). In short, value-message incongruity would lead to defensiveness and avoidance, especially when the issue is highly moralised (Täuber et al., 2015).

1.6.2 Moral Foundations and Environmentalism

Moral foundations theory (MFT) is a pluralistic framework addressing moral judgments from a multidimensional perspective (Graham et al., 2009). According to MFT, there are five components of moral intuitions, i.e., harm, justice, loyalty, authority, and purity. Harm and justice are referred to as individualistic foundations and endorsed more strongly by liberals than by conservatives. Loyalty, authority and purity are binding foundations, which conservatives rely on more strongly than liberals (Graham et al., 2011). Moral foundations were shown to predict a range of different personality variables, as well as social and political attitudes (Smith et al., 2017).

1.6.3 MFT, Political Ideology and Environmentalism

Moral foundations are closely linked to political ideology as liberals and conservatives tend to give weight to different moral foundations (Graham et al., 2009). Past research focused on the ideology-environmentalism link and its relationship to moral foundations (Feinberg & Willer, 2011; Wolsko et al., 2016). Liberals perceive mitigation of environmental as a moral obligation, primarily because they endorse moral foundations of harm/care and justice more than conservatives (Feinberg & Willer, 2013). The positive link between left-wing political views and environmentalism was documented by many researchers (Fobissie & Inc, 2019; Panno et al., 2018). However, this link could be due to various factors such as framing of environmental issues. Indeed, past research underlined that environmental campaigning relied heavily on moral foundations associated with liberal ideology, a trend which might account for political polarization of environmental attitudes (Wolsko et al., 2016). For example, highlighting environmental issues as violation of justice, i.e., an

individualising foundation, towards natural elements decreased pro-environmental engagement for those with right-wing ideology (Whitmarsh & Corner, 2017).

Some other research suggested that greater disbelief or denial of environmental problems such as climate change among conservatives were attributable to “solution aversion”. Specifically, conservatives were less likely to show support environmental policies which place regulations and restrictions on the “free market economy”, thus conflicting principles of economic conservatism or neoliberalism (Campbell & Kay, 2014). In other words, rather than inherent antagonism to pro-environmental efforts, conservatives tend to dismiss proposed actions and outcomes, leading resistance to the environmentalist messages in general (Wolsko et al., 2016).

Indeed, research demonstrated that framing is crucial when communicating environmental problems to people across the political spectrum. Conservatives reported similar levels of pro-environmental attitudes to liberals when environmental problems were framed as violations of purity/sanctity, a binding foundation (Feinberg & Willer, 2013). Similarly, Wolsko and colleagues (2016) showed that pro-environmental messages emphasizing binding foundations of loyalty, authority and purity diminished the gap between liberals and conservatives in terms of conservation intentions, climate change beliefs, and donations to an environmental organization (Environmental Defense Fund). This effect was even more prominent when the message source belonged to one’s ingroup (Wolsko et al., 2016). Hence, environmental messages should be tailored to the worldview and ideology of the audience to be more effective in changing attitudes.

Moral foundations were also found to be linked to activism in various domains. For example, Milesi and Alberici (2018) showed among activists different moral foundations predicted future collective action intentions depending on the issue.

Intentions to participate in women's right activism, supporting water supply equality, and strengthening local community were predicted by harm/care, justice/fairness, and loyalty foundations, respectively. It should be noted that this study used a sample of activists, for which the relevant moral foundations were considerably higher. For instance, endorsement of harm/care was higher among women's rights activists whereas for water supply activism justice foundation was higher, compared to other foundations (Milesi & Alberici, 2018).

Past literature showed a positive association between harm and justice foundations and environmentalism (Milfont et al., 2019) and sustainable consumption habits (Watkins et al., 2016). Belief in climate change, was also predicted positively by individualising foundations and negatively by binding foundations among American participants (Dickinson et al., 2016). In a similar vein, self-transcendental values of benevolence and care were positively related PEB whereas hedonistic or self-enhancing motivations, were not (De Groot & Steg, 2007). The prominent role of "care" towards the environment as a moral responsibility is strongly embedded within most pro-environmental messages. Compassion towards the elements of nature are key components environmental activism discourse, and the importance of justice as a relational principle in the environmental context is evident in environmentalist accounts (Chan et al., 2016; Jia et al., 2017). Hence, individualising foundations have a positive link to pro-environmental engagement. Binding foundations were found to be either negatively linked to environmentalism by some studies (Watkins et al., 2016) whereas some others did not find such an effect (Milfont et al., 2019)

It should be noted that although harm foundation is a strong predictor of pro-environmental engagement, there are several pitfalls associated with excessive use on care-based environmental messages to promote environmental concern. For example,

some people may not feel care and concern towards non-human entities to the same extent they do for humans. Due to their lesser cognitive capabilities and intelligence, and perceived dissimilarity to humans, animals might get excluded from the sphere of moral responsibility and justice (Opotow, 1993). Perspective-taking and empathy for maltreatment of animals may help increase concern towards them, but decrease perceived similarity to the self (Rottman et al., 2015). On the other hand, emphasizing similarity of animals to humans to garner concern might lead to the perception of these animals as “unnatural” or in competition with human beings (Schultz, 2000). In addition, in the absence of an explicit outgroup victimised by environmental wrongdoings as in the case of global environmental issues, care-based environmental messages may not be effective (Täuber & Van Zomeren, 2015).

1.6.4 Moral Emotions and Environmentalism

Moral judgments are almost always coupled with emotional reactions (Skitka et al., 2005). People who are high on environmentalism express anger and disgust towards third parties who violate the moral responsibilities and act careless towards nature, whereas people who are low on environmentalism are characterized primarily with apathy and lack of concern towards the environment (Jia et al., 2017).

Violation of a moral standard in private and public invokes feelings of guilt and shame respectively (Smith et al., 2002). Guilt is also experienced as a result of the attribution of responsibility to oneself or one's ingroup due to environmental damage (Mallett et al., 2013). However, guilt is dampened when given the option to blame an outside agent for their negative impact on the environment, e.g., for profit corporations (Rothschild et al., 2012). Reparative behaviour aimed to reduce the environmental damage stems from feelings of shame and guilt whereas restorative behaviour is related to anger (Bamberg & Möser, 2007). In the case of a large scale and gradual

environmental problem such as climate change where targeting a single responsible entity is highly difficult, therefore anger may not be a prominent factor behind willingness to restore the damage. It should be noted that anger results from moral violation by a third party whereas self-directed anger is not related to moral wrongdoings of the self (Ellsworth & Tong, 2006). For instance, feedback regarding individual carbon footprint increased the levels of guilt, but not anger and shame (Mallett et al., 2013). Indeed, collective guilt, but not anger, was found to be an important antecedent of neighbourhood-based climate action intention (Rees & Bamberg, 2014). In addition, anger was not related to participation intention to a pro-environmental initiative when controlled for efficacy, identity, and perceived behavioural control. It was suggested that the type of collective action, i.e., taking part in a local energy initiative, requires constructive rather than destructive behaviour, the anger may not play a role as it did in other types of collective action.

Research also examined the role of pride as a positive moral emotion, which is a result of personal or group-based pro-environmental action. Past research showed that pride due to past PEB predicted future engagement provided that perceived social norms were pro-environmental (Bissing-Olson et al., 2016). Harth and colleagues (2013) presented German participants with ingroup environmental wrongdoing (vs. environmental protection) which resulted in higher guilt and anger (vs. pride) regarding the ingroup's actions. Moreover, guilt was linked to intentions for reparation of the environmental damage, anger was linked to willingness to punish responsible ingroup, whereas pride was not linked to either of these behaviours but to ingroup favouritism (Harth et al., 2013). Another study revealed that collective guilt of environmental degradation mediated the link between negative feedback about carbon footprint at a collective level and support for a pro-environmental group, whereas collective pride did

not. Pride also did not increase with positive feedback at the collective level (Mallett et al., 2013). This was in line with the findings of Bamberg and Möser (2007) where feedback concerning one's actions produced guilt which in turn led to greater support for a pro-environmental group, i.e., a reparative behaviour. Some studies failed to find the effect of environmental guilt on subsequent PEB, however (Bissing-Olson, 2016). Researchers argued that perceived behavioural control as well as perceived responsibility might have moderated the effect of guilt on future PEB.

Although responsibility is a key determinant of environmental action, trying to induce guilt and responsibility may trigger defensiveness where the responsibility of environmental harm is attributed to third parties, or the invalidation of evidence (Markowitz & Shariff, 2012). Research indicated that efficacy beliefs might play a role in determining how much guilt could be experienced without deflating responsibility to other agents. Specifically, when the future consequences of environmental problems are framed as moderate (vs. dire) and human responsibility was emphasized, collective guilt due to environmental problems was highest, which in turn led to more willingness to conserve energy and pay green taxes (Ferguson & Branscombe, 2010). When environmental issues are framed as having dire consequences, people may feel like nothing can be done to repair the harm, which would impair their feelings of efficacy. Hence, it can be argued that presenting environmental problems as challenges that could be acted upon not only improves efficacy beliefs but also might leave more room for experiencing negative emotions without resistance.

1.7 Fear Appeals in Collective Efficacy in Environmental Issues

Past research examined the effectiveness of fear appeals in motivating environmentalism. Hornsey and colleagues (2015) found that perceived risk and distress due to environmental problems were positively linked to self-efficacy, as well

as the efficacy of the government and scientists. However, experimentally inducing fear led to higher levels of collective efficacy but not self-efficacy. Hence, those who feel environmental problems pose a significant threat felt more collective control over reversing the negative impacts of environmental degradation. It was argued that group efficacy, based on collective rather than individual power, could have been more effective in reducing the fear than self-efficacy (Hornsey et al., 2015). Similarly, in another study, van Zomeren and colleagues (2010) found that inducing fear by presenting climate change impacts resulted in higher collective climate action intentions and collective efficacy. Markowitz and Shariff (2012) also suggested that reminding environmental degradation (vs. lost benefits of environmental mitigation) may be more effective in motivating people to act pro-environmentally. In short, these results provided support for motivated control hypothesis which posits that feeling control over events, i.e., self-efficacy can diminish the perceived threat (Bandura, 1990).

However, presenting environmental problems as dangerous and having dire consequences could lead to apathy or denial by reducing efficacy (Feinberg & Willer, 2011; Jia et al., 2017). Hence it is crucial to strike a balance between eliciting concern while sustaining efficacy when using fear appeals. It is also possible that when people feel more efficacious about their ability to solve an environmental issue, they are more willing to accept the risks. The causal influence of collective efficacy on perceived threat remains to be determined by future studies.

It should also be noted that perceived threat, risk perception, and fear are used interchangeably in most of the studies however cognitive and emotional components might have a different relationship to action intentions, which suggests there is a need for greater conceptual clarity regarding different components of risk perception.

1.8 Intergroup Approach to Environmental Issues

Contemporary portrayal of environmental problems tends to pit industries against environmentalist groups as both having clashing objectives. Indeed, researchers argued that environmental activism, specifically in the context of climate change, could be examined within the framework of intergroup relations (Postmes, 2015). Social identity theory posits that a significant aspect of our self-concept is based on the membership to the groups we are a part of, which would diminish the perceived differences among ingroup members and increase the differences between ingroup and outgroup members, leading to intergroup polarisation (Hornsey, 2008). Fielding and Hornsey (2016) argued that our perceptions and behavioural intentions concerning environmental movements are largely determined by our collective identities and group memberships.

Climate change is a collective threat yet perceived differently by different groups, especially based on political affiliation. It is a politically polarised issue which makes the communication of the issue to certain segments of the population challenging. Especially in the US this polarisation between liberals and conservatives is getting starker (Dunlap, 2013). It was shown that climate change sceptics and believers derived distinct identities based on their climate change beliefs, which predicted their pro-climate action intentions, anger towards the other group and efficacy beliefs (Bliuc et al., 2015). The impacts of political ideology on the belief of climate change were more apparent when the political identities were made more salient (Unsworth & Fielding, 2014). Climate change beliefs also form opinion groups above and beyond political views. Both climate change believers and deniers use campaigning to convince the public to their own point of view and there is an ongoing clash between two groups. Both groups are also assumed to have a distinct set of values, ideas, beliefs and frames concerning the organization of society and production mechanisms which are irreconcilable, leading to a “logic schism” (Hoffman, 2011).

Indeed, research showed that climate change deniers target climate scientists, organizations such as IPCC, as well as environmentalists and journalists, who are promoting climate change mitigation through reduction of carbon output. The deniers also try to refute the scientific claims supporting anthropogenic climate change (Knight & Greenberg, 2011).

The perception of climate change is also closely linked to other relevant group memberships such as nationality. Portraying the ingroup (i.e., the US) vs. outgroup (China) behaviour as damaging the environment led the US citizens to show less support for climate policies and concern for climate change (Jang, 2013). Smith et al. (2012) showed that when people perceive that ingroup behaviour and injunctive norms are in conflict, their tendency to conserve energy is reduced.

Apart from political polarization and opinion groups, as the global inequality on the burdens of ecological disasters go on, there might be an increase in the level of conflict between countries that are particularly vulnerable to the impacts and those that are more resilient. Research suggests that due to this group-based conflicts on how to respond to climate change, climate change communications should be examined within the realm of intergroup relations. Specifically, negative impacts of climate change are being and will be experienced more strongly by less developed countries which are geographically and economically more vulnerable to shifts in climate, whereas economically developed countries disproportionately contribute to climate change and greenhouse gas emissions, thus forming two different groups (Swim & Bloodhart, 2018).

An additional group-based consideration to climate change relates to the intergenerational perception of the impacts. Meleady and Crisp (2017) applied intergroup perspective and social categorization theory to the framing of climate change by examining the perception of future generations (i.e., the temporal outgroup) who would be affected by

the actions or the inaction of the present generation (the temporal ingroup) on climate change. They found that increased perceived intergroup similarity and positive outgroup attitudes is linked to higher intentions to engage in pro-environmental behaviours (Meleady & Crisp, 2017).

Thus, approaches to environmental activism, primarily climate activism, require a group-based understanding of the phenomenon and consideration of the intergroup dynamics. Having described main factors associated with PEB in general, the next section will describe collective environmental action and its main determinants. A specific focus was given to collective action among other PEB, as it is the main dependent variable examined in this thesis.

1.9 Activism as a Distinct Category of PEB

Past research indicated that environmental activism has different determinants than personal level PEB. For instance, altruistic and biospheric values accounted for less than 5% of the variability of high-cost environmental activism (protesting) whereas these values account for up to 35% variability for non-activist PEB, e.g., green consumerism, willingness to pay, and environmental citizenship (Stern et al., 1999). In addition, Norm Activation Model and Theory of Planned Behaviour (TPB) explained only a quarter of the variability in environmental activism whereas more than half of the variability for other PEB (Bamberg & Möser, 2007). Similarly, altruistic values and self-efficacy strongly predicted intentions for green consumerism and citizenship behaviour but not for environmental activism. Environmental activism was weakly correlated with other types of PEB (e.g., green consumerism, willingness to pay) in some studies (Stern et al., 1999) but strongly in others (Lee et al., 2014; Dono et al., 2010) potentially due to methodological differences such as using multiple items pertaining to different facets of activists' behaviour. However, it was shown that activism intentions are mostly predicted by social identity, i.e., identification with

environmentalists and environmental citizenship (Dono et al., 2010). Research thus indicated that models of collective level variables are more effective than individual level ones in predicting environmental activism and environmental citizenship, which are considered as public level PEB.

1.9.1 Environmental Activism as Collective Action

Environmental activism relates to different set of behaviours such as membership to a pro-environmental group, performing activities within that group, and participating in political actions (Stern, 2000). Research indicated that collective level PEB is needed for effective mitigation of climate change and other environmental problems which are mostly motivated by collective variables such as group efficacy and movement identification (Bamberg et al., 2015). In a similar vein, collective variables such as network ties were more strongly related to environmental activism than demographic characteristics, and these collective variables explained around 17% variability within pro-environmental actions whereas half of the variance in environmental activism (Tindall et al., 2003). Similarly, group-based variables such as membership to an environmental group explained larger variability (22%) in environmental activism than demographic or psychological variables, which in combination explained 13% variability (McFarlane & Boxall, 2003). Similarly, participative efficacy, social identity and perceived behavioural control were significant predictors of collective climate action intention whereas attitudes, and subjective norms were not, indicating the importance of group-based variables in collective environmental action (Bamberg et al., 2015). Also, political activism concerning air pollution was found to be largely predicted by collective interest variables (38%) whereas pro-environmental personal behaviour was explained to a lesser degree, only one-fifth of the variability was accounted for by the model (Lubell et al., 2006). In addition, social identity predicted activism strongly

through environmental citizenship but not via other forms of personal PEB, supporting the collective nature of environmental activism (Dono et al., 2010).

1.9.2 The Role of Social Identity

Social identity is a central group-level variable which was shown to be a prominent motivator of collective action (Van Zomeren et al., 2004; Van Zomeren et al., 2011). Identification with an environmentalist group predicted greener consumption habits, willingness to pay, and environmental activism indirectly through environmental citizenship (Dono et al., 2010). Similarly, identification with a local green movement was the strongest predictor among other group-based factors collective and self-efficacy, anger, social norms, and perceived behavioural control (Bamberg et al., 2015). Also, activism intentions were predicted by group norms and efficacy beliefs for high identifiers, but by perceived behavioural control and attitudes for low identifiers (Bamberg et al., 2015). Green identity, i.e., an amalgamation of environmental self-identity with activist group identification predicted higher perceived risk and distress due to environmental problems (Hornsey et al., 2015). Social identities not having a direct relevance to environmentalism might be effective in motivating action. For instance, stronger sense of community, i.e., feelings of inclusion and connectedness to one's community, predicted positive social norms about activism, which then predicted higher intentions to engage in a local pro-environmental climate group (Rees & Bamberg, 2014). Community identity was also positively linked to willingness to engage in collective energy initiatives through trust and social norms about pro-environmental behaviour (Kalkbrenner & Roosen, 2016). National identification, on the other hand, was related negatively to pro-environmental behaviour and positively to denial of environmental problems and system justifying tendencies (Feygina et al., 2010).

1.9.3 The Role of Efficacy

Belief in the impact of one's actions, i.e., self-efficacy, was positively related to environmental concern and pro-environmental intentions (Jugert et al., 2016; Lauren et al., 2016). In the context of climate change, low levels of perceived efficacy was argued to magnify the psychological distance from climate change, and hinder climate action (Ockwell et al., 2009). Group-based efficacy was shown to predict intentions to participate in grassroots environmental group more strongly than self-efficacy (Rees & Bamberg, 2014b; van Zomeren et al., 2010). On the other hand, participative efficacy, i.e., the perceived contribution of one's actions within the group, emerges as the strongest predictor of collective climate action, overriding the effects of collective efficacy (Bamberg et al., 2015). (Lubell, 2002) further distinguishes between internal (personal efficacy) and external political efficacy in that the first refers to the individual's beliefs that he or she can participate in a politically significant behaviour whereas the latter is related to the level of responsiveness from political organizations and government. Personal efficacy (i.e., internal political efficacy) is partly dependent on external political efficacy, meaning the perceived responsiveness from the government influence one's belief regarding personal contribution to make a significant difference (Lubell et al., 2006). Hence, multiple dimensions of efficacy seem to influence and reinforce each other in motivating environmental activism.

1.9.4 Environmental Activism Frameworks

Past research utilised several theoretical models to examine the determinants of pro-environmental behaviour, although there are fewer models specifically designated to explain environmental activism. As an example, (Marquart-Pyatt, 2012) put forth the individual variables, such as knowledge, individual resources such as education, awareness of consequences, environmental concern, and self-efficacy as the main drivers of environmental activism. According to two-stage model of environmental action by Lubell (2002) perceived

risk and responsibility, emotional investment in the issue, self-efficacy, and the responsiveness of the government, i.e., response efficacy would become determinants of environmental activism. These models did not consider social identity components of climate activism. A more comprehensive collective action model tested within the environmental context is Social Identity Model of Collective Action (SIMCA: van Zomeren et al., 2008). Rees and Bamberg (2014) found that social identity, which was operationalized as sense of community/neighbourliness, predicted collective action intentions through social norms, which was an additional variable to original SIMCA framework. Bamberg et al. (2015) tested the extended SIMCA which included participative efficacy (Van Zomeren et al., 2013) to explain participation intentions to a community energy initiative. Participative efficacy and social identity (i.e., movement identification) predicted activism intentions whereas collective emotions and group efficacy was not. Social Identity Model of Pro-environmental Action (SIMPEA: Fritsche et al., 2018) is another theoretical framework of environmental activism utilising social identity approach. SIMPEA proposes that identification with the ingroup (e.g., environmentalists, citizens), collective efficacy beliefs, and group norms foster pro-environmental behaviour and issue appraisal. A key contribution of SIMPEA is that the pro-environmental action could be motivated by various forms of social identification which are not directly related to environmentalism, e.g., local communities, genders etc. (Fritsche et al., 2018). Despite offering valuable insights into the nature of social identity basis of pro-environmental action, SIMPEA is yet to be tested empirically.

1.10 Conclusion

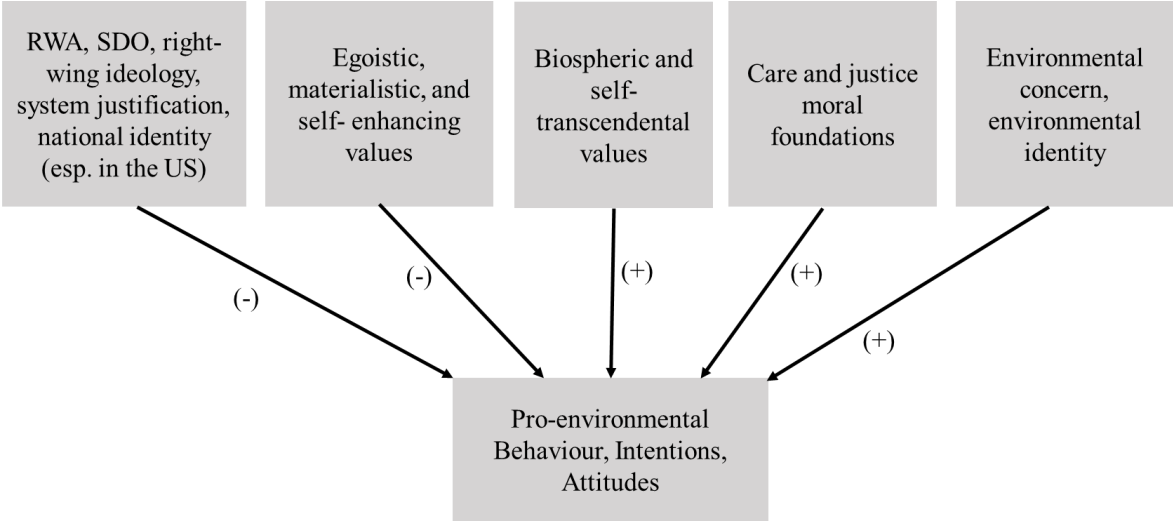
This chapter summarised the factors that are most influential in determining pro-environmental engagement, where significant attention was given to the variables that are examined in the following empirical chapters. Primarily, self-transcendental values, environmental concern, belief in environmental degradation, and acceptance of human

responsibility in solution of environmental issues were identified as main personal determinants pro-environmental behaviour. Political orientation and ideological attitudes also appeared as prominent factors associated with environmentalism along with moral foundations. Right-wing political ideology and system justifying ideologies appeared as negatively linked to environmental engagement whereas left-wing political views and individualising foundations were positively related to a range of pro-environmental behaviour. However, the presentation of environmental issues play an important role in amplifying or diminishing this political polarisation. Hence, framing literature sought ways to identify shared values and provide a common ground for those with dissimilar political opinions. Figure 1.1 summarises the main findings in the literature on the individual-level predictors of environmentalism. The following empirical chapters (Chapters 3-5) in this thesis will examine the role of moral foundations, political ideology, and environmental concern among these variables.

In the final section, environmental activism, conceptualised as a form of collective action, was identified as a distinct component of pro-environmental behaviour. Hence, the role of collective variables such as group efficacy and social identity were examined along with frameworks of environmental activism. The collective action variables in these frameworks, i.e., emotions, efficacy, and social identity, will be the focus of the following empirical chapters.

Figure 1.1

Summary of Individual-Level Predictors of Pro-Environmental Engagement



Chapter 2: Psychological Distance from Climate Change

2.1 Chapter Overview

Despite increasing public concern and overwhelming scientific agreement on the severity of climate change risks for the 21st century (IPCC, 2019), many people remain reluctant to change their behaviour or support climate change mitigation. The lack of behavioural engagement has been attributed by some researchers to the abstract and distant nature of climate change (Gifford, 2011). Different aspects of “psychological distance” from climate change have also been linked to lower perceived severity and impacts, and willingness to act pro-environmentally (Milfont & Duckitt, 2010; Singh et al., 2017). The evidence, however, has not been consistent, and some has indicated there may be more beneficial impact of *distant*, rather than proximal, framing of climate change.

The present chapter summarises past literature on the psychological distance from climate change. Firstly, the evidence on the relations between psychological distance and pro-environmental engagement was presented. Secondly, findings on four dimensions of psychological distance were reviewed. Then, similarities and differences between the dimensions, their intersections, and relevant factors moderating their impact were discussed. Finally, potential mechanisms for conflicting patterns of results and theoretical gaps in the literature were examined.

2.2 Construal Level Theory and Psychological Distance

The psychological distance of an event refers to its perceived closeness in terms of its certainty (or hypotheticality), personal involvement, time frame, and spatial position (Trope & Liberman, 2010). Construal Level Theory (CLT) posits that psychological distance determines how the event will be mentally represented, that is, at a more concrete or abstract level. More distant events are construed at a higher level and as such are more abstract, schematic, and decontextualized; whereas closer events are constructed at a lower level and

are more concrete, detailed, and contextualized (Trope et al., 2007). High-level construal involves a focus on the “why” rather than the “how” of action (Trope & Liberman, 2010). People vary in their tendency to think at a more concrete versus abstract level (e.g., (Vallacher & Wegner, 1989) but construal level can also be induced and modified contextually (see (Burgoon et al., 2013); for an overview). Importantly, the level at which a cognition is construed impacts its subjective evaluation, and from there actions tendencies and behaviours (Conway & Peetz, 2012).

Psychological distance has proven a key factor when it comes to communicating about climate change. Indeed, the potential risks and consequences associated with climate change (such as species extinction or sea level rises) are likely to be perceived as remote from the current experience in terms of temporal, spatial and social distance, and perceived certainty (van der Linden et al., 2015). People often imagine that climate change will primarily affect future generations and people in remote regions of the world (Weber, 2016). In a study on the perception of several issues, Carmi and Kimhi (2015) showed that natural disasters and climate change were perceived as a psychologically more distant threat (on all four dimensions of distance) than other prominent problems such as general environmental deterioration, unemployment, and internal and external threats to national security.

Yet, construing climate change as a distant and only hypothetical threat tends to decrease the subjective perception of risks (e.g., (Leiserowitz, 2006), perceived threat severity (e.g., (Carmi & Kimhi, 2015) and concern associated with it (Jones et al., 2017). This subjective evaluation tends to undermine people’s willingness to act pro-environmentally (e.g., intentions to lower energy use, Spence et al., 2012) and to support policies trying to tackle the issue (e.g., Leiserowitz, 2006). Moreover, decreasing the psychological distance of climate change does not always result in higher pro-environmental engagement. Some research has even found increased psychological distance to ameliorate pro-environmental

engagement. This discrepancy in findings hints to the existence of moderators of the effect of distance, which will be systematically identified and discussed below.

2.3 The Four Dimensions of Perceived Distance of Climate Change

2.3.1 Hypothetical Distance (Uncertainty)

The hypotheticality or uncertainty of an event is the first dimension of psychological distance. It is a key dimension as pertains to climate change, given the complexity of the phenomenon and potential uncertainty around its potential development, timeline, and consequences. It is likely that laypeople detect the complexity and experience a degree of confusion and uncertainty when thinking about climate change, which may make them reluctant to take action (Gifford et al., 2011). For example, (Singh et al., 2017) found that beliefs in the likelihood of climate change and its consequences explained substantial parts of variance in both concern about climate change (more than 30%) and support for climate adaptation policies (more than 50%); greater uncertainty leading to lesser concern and lesser policy support.

The literature points to different levels or facets of uncertainty concerning climate change. *Trend sceptics* question a real increase of the temperature levels on a global scale. *Attribution sceptics* question human responsibility in climate change. *Impact sceptics* question the large-scale future effects of climate change (Rahmstorf, 2004). Uncertainty about the impact of climate change (i.e., impact scepticism) is larger than uncertainty about its existence (i.e., trend scepticism (Spence et al., 2012) and, than climate change denial, which refers to an active rejection of the issue (implying high certainty in the *nonexistence* of climate change) (A. Leiserowitz et al., 2010).

The different dimensions of uncertainty perceptions tend to be positively intercorrelated and form a reliable scale such that people who have high scores on trend scepticism tend to score higher on other dimensions as well (Whitmarsh, 2011). Nonetheless,

most of psychological distance research has operationalized the hypothetical dimension as uncertainty rather than scepticism or denial, probably due to the lower prevalence of the latter. The present review therefore focuses primarily on uncertainty.

A range of variables have been identified as affecting individual differences in uncertainty about climate change. These include greater religiosity, lower education, and more right-wing political orientation. Investigating personal beliefs and ideology, Ziegler (2017) observed that respondents in the USA who endorsed more right-wing (or conservative) ideology expressed greater uncertainty in the existence of anthropogenic climate change. Similarly, Feygina et al. (2010) found that denial of greenhouse gas emissions was higher among political conservatives, and those with stronger system justification beliefs, and more specifically *economic* system justification beliefs. Also, among a sample of British respondents environmental concern was positively linked to left-wing political ideology and both were negatively linked to scepticism concerning scientific agreement on climate change impacts and existence (Whitmarsh, 2011).

Conservatives' greater uncertainty could partly be explained by their opposition to the solutions offered by climate scientists that contradict visions of continuous economic growth (Campbell & Kay, 2014). Also values and objectives embedded in the environmental campaigning discourse (e.g., biospheric concerns and intergenerational justice) are likely to appeal more to liberals than conservatives (Wolsko, 2017). However, the link between political orientation and environmental concern is not consistent across countries. For example, the negative relationship between climate change beliefs and political ideology appears to be stronger in USA than in Germany, but almost negligible in China (Ziegler, 2017). Similarly, in a cross-national meta-analysis Hornsey et al. (2018) revealed that uncertainty of the anthropogenic climate change and political ideology is much more closely linked in the US compared to 24 other countries, where the lowest levels of polarization of

climate change opinions were observed in South Korea and India. Therefore, it would be premature to claim that the link between political ideology and climate change uncertainty is generalisable or inevitable.

2.3.2 Uncertainty as an Antecedent to Climate Engagement

Perceived hypothetical distance from climate change (i.e., a composite measure of all three types of uncertainty) was negatively associated with climate change concern and support for mitigation policies (Jones et al., 2017; Singh et al., 2017). There are some correlational studies focusing on the outcomes of climate change uncertainty. For example, uncertainty concerning the existence and human causality of climate change was negatively associated with support for policy to reduce emissions (Sibley & Kurz, 2013). Furthermore, a cross-sectional survey among USA participants revealed that lower levels of perceived scientific consensus concerning the existence of climate change was linked to lower levels of belief in human causation and collective efficacy in mitigating negative impacts, which in turn were related to a lower support for mitigation policies (Ding et al., 2011). On the flip side, emphasizing a high level of agreement among scientific authorities regarding anthropogenic climate change may promote collective action and policy support by reducing potential uncertainty surrounding the issue (Lewandowsky et al., 2013). A comprehensive meta-analysis revealed that a more certain belief in anthropogenic climate change was moderately related to private pro-environmental intentions, green policy support, and prioritization of environmental issues over economic ones, but only weakly related to public and personal pro-environmental behaviour, and support for carbon tax (Hornsey et al., 2016).

The behavioural outcomes of perceived uncertainty of climate change may also at times feedback to affect beliefs. Specifically, McCrea et al. (2016) longitudinal study showed that climate change scepticism increased for American participants who voted for the Republican party, whereas the impact of scepticism on voting behaviour was weaker.

In summary, evidence from research using either composite or more specific measures of uncertainty concluded that uncertainty generally is a key dimension of the psychological distance of climate change, predicting a range of variables including *lower* support for mitigation actions. Differences in self-reported uncertainty are related to individual factors such as personal beliefs and political ideology. However, exposure to certain (consensual or contradictory) sources of information can modify the level of perceived uncertainty.

2.3.3 Temporal Distance of Climate Change

Temporal closeness or remoteness of an event is the second dimension of psychological distance. Climate change impacts are mostly perceived as happening in a distant future (Gifford et al., 2011), i.e., a large temporal distance that might contribute to a more abstract perceptions of the associated risks (Trope & Liberman, 2010). Crucially, most mitigation actions require some form of immediate sacrifice from the public whereas benefits are unlikely to be observed anytime soon. Yet, people are likely to discount future costs of climate risks compared to immediate costs of mitigation actions. This makes it difficult to motivate them to make these sacrifices based on explicit cost-benefit analyses. Indeed, Singh et al. (2017) found that greater temporal distance of climate change predicted lower support for mitigation policy implementation, and this effect was mediated by lower environmental concerns. Conversely, presenting negative climate change impacts such as extreme droughts and temperature rise projected for the next summer (vs. for the end of 21st century) led to greater concern for climate change, which in turn led to higher intentions to purchase energy-efficient lightbulb among South Korean and American university students (Kim & Ahn, 2019).

In an extensive review on time perspective of climate change, Pahl et al. (2014) suggested that projections of climate change impacts in the distant future failed to elicit a

sense of urgency, and hence, of personal responsibility. Others suggested that the distant nature of climate change impacts failed to elicit the emotional responses necessary to trigger moral judgment, explaining why people would fail to identify climate change as a “important moral imperative” (Markowitz & Shariff, 2012).

General reluctance to act upon future consequences and to think about the future is likely to be stronger among some people than others, a tendency that has been operationalized as ‘future time perspective’ (Zimbardo et al., 2017) or ‘consideration of future consequences’. Future-oriented thinking is related to a greater adoption of pro-environmental behaviour and higher commitment to pro-environmental collective action (Bruderer Enzler, 2015; Lalot et al., 2020). This has practical implications because a future orientation can be trained and improved. For example, engaging regularly in “episodic future thinking” (i.e., imagining or simulating experiences that might occur in one's personal future) reduces delay discounting tendencies (Bromberg et al., 2015).

Subjective perception of time frames, rather than objective temporal distance, is the relevant determinant for behavioural intentions. For example, Bashir et al. (2014) reported that participants in an experiment exhibited higher motivation to engage in a range of pro-environmental behaviours (carrying a reusable cup, etc.) when adverse consequences of climate change were represented pictorially as near (vs. remote) on a visual time scale, although both groups were asked about the same year (10 years in the future). Presenting this future year as subjectively closer also impacted actual pro-environmental behaviours self-reported over the course of the following week. Finally, this positive impact was mediated by a more concrete representation of climate change impacts. Hence, this study suggests that even objectively distant consequences could be made more tangible by presenting them as subjectively closer, which in turn could motivate communication recipients to undertake action (see also Kim & Ahn, 2019, Rickard et al., 2016, and Roh et al., 2015).

2.3.4 Spatial and Social Distance of Climate Change

Spatial and social distance constitute the third and fourth dimensions of psychological distance. Theoretically, they are independent constructs, in the sense that an event can be conceived as spatially close but personally irrelevant, or vice-versa. In practice, however, because people living in distant countries are usually perceived as less similar, the spatial and social distances tend to covary. People who are perceived as less similar to the self are likely to be represented at a more abstract and less specific level, i.e., as socially more distant (Liviatan et al., 2008). Research comparing the effects of both types of distance in relation to climate change is rather scarce. In fact, operationalizations of social distance are often conflated with spatial distance (Lujala et al., 2015) and it is difficult to disentangle the parts of their respective effects in many studies. For that reason, it is necessary to consider them together in the present section.

Climate change impacts are often perceived as spatially distant, such that it is mostly thought of as having more dire consequences for people living in faraway countries (Gifford et al., 2011). Importantly, some evidence reveals a negative relationship between perceived spatial distance and pro-environmental intentions and support for green policies (Carmi & Kimhi, 2015; Jones et al., 2017). In addition, experimental studies showed that decreasing spatial distance increases pro-environmental policy support and promotes engagement in pro-environmental behaviour (Jones et al., 2017). For example, in a British sample, the mention of climate change-related events in Cardiff, as compared to Rome, led to greater environmental concern and issue engagement (Spence & Pidgeon, 2010). Moreover, localizing has proved effective in motivating people to exhibit pro-environmental behaviour not only at the local but also at a more global scale (e.g., global mitigating actions). An experiment among New Zealand participants revealed that simply asking about local adaptation strategies to proximal problems (in this case, sea level rises) led to higher level of

mitigation intentions (emissions reduction) as compared to asking only about climate change mitigation (Evans et al., 2014). Similarly, among American participants, Kates and Wilbanks (2003) showed that highlighting local (vs. distal) impacts of climate change (i.e., highlighting local sources of greenhouse gas emissions and pinpointing proximal locations vulnerable to climate change impacts) increased the motivation to engage in mitigation behaviour. Chu and Yang (2019) showed among American participants a spatially close framing of climate change (i.e., impacts in the USA vs. in Singapore) increased negative emotions such as anger, fear, sadness, guilt, anxiety, and shame; where anger and anxiety predicted greater pro-environmental intentions, as well as policy support.

Yet some research has found no effect of (local vs. distant) spatial framing on pro-environmental intentions. Schuldt et al. (2018) presented American participants with the Maldives and USA on two differently scaled maps varying the visual distance between the two, but this had no impact on participants support for climate policies (see also Manning et al., 2018). Some research even indicates that the reverse could also be the case. For example, perceived impacts of climate change on remote parts of the world were positively related to action intentions (of reducing energy use), an effect mediated by increased environmental concern (Spence et al., 2012). Hence, the effects of “proximising” could be more complex than is commonly assumed (Brügger et al., 2016). Also, place attachment, which can be defined as level of concern for the future of a certain location (at different levels, including one’s local surroundings, country, or even the whole world), has been shown to moderate the impact of spatial distance framing. For example, messages highlighting local impacts of climate change were more effective only for participants who were strongly attached to their local surroundings (Brügger et al., 2015). Other research similarly found an interaction between place attachment and local, but not global, message framing (Scannell & Gifford, 2013).

Social distance from climate change, that is, considering climate change as impacting people who are similar versus dissimilar to oneself, is also an important correlate of climate policy support (Singh et al., 2017). Opinion polls have identified large variations between countries regarding the extent to which citizens expect to be personally affected by climate change. As with the other distances, perceiving climate change as less personally relevant, i.e., more socially distant, decreases willingness to take action and support mitigation policies (Maiella et al., 2020).

2.4 Reuniting the Dimensions of Psychological Distance

The following section will present and discuss the findings comparing different aspects of psychological distance. Primarily, research that has directly compared the impact of different distances on climate change engagement or examined the link between those distances will be summarised. The main aim here is to (*a*) examine the similarities and differences in the way four dimensions impact climate change engagement, and (*b*) discuss evidence on the underlying mechanisms of four types of distance.

2.4.1 Conceptual Similarities and Differences

The first question is whether the four distances present specificities and unique effects, or whether they merely represent different ways to tap into a single construct of construal level. According to Trope and Liberman (2010), the different types of psychological distance may influence action intentions and risk perceptions in a similar way because they all, at a higher level, lead to a more abstract and less vivid construal of the phenomenon. Therefore, it can be argued that the different distances may work together, on the same mental plane, in order to motivate climate action (Spence et al., 2012). Some research provides evidence that the measures of the social, spatial, and temporal distance as well as perceived scientific agreement and perceived uncertainty about climate change all form one reliable psychometric construct. In one study, Carmi and Kimhi (2015) measured

the subjective psychological distance of climate change as a composite aggregate of all four dimensions, and found it to be negatively related to negative emotions in response to environmentally irresponsible behaviours, to the perceived severity of climate change, and to willingness to make personal sacrifices in terms of money, time, personal convenience and mode of travel (see also Singh et al., 2017).

Other research similarly suggests empirical as well as conceptual interdependence between the different dimensions. First, lower certainty portrayed by media coverage of climate change should increase perceived temporal distance of the impacts, and conversely, a higher temporal distance could imply greater perceived uncertainty, as events believed to take place in a distant future may be associated with a lower probability (McDonald et al., 2015a). Second, the social and temporal distances are also intertwined. People (imagined as) living in the far future are usually pictured as having culturally and socially different features from more temporally proximal ones (Stephan et al., 2011). Hence, a higher temporal distance may lead to perceptions of greater social distance as well. Finally, and as stated above, spatial, and social distances tend to covary. Experimental research has also shown that manipulating social distance to be greater led to increased spatial distance perceptions (Won et al., 2018).

Despite evidence that the four dimensions tend to covary some findings suggest heterogeneity in the way distances change in response to manipulations. For instance, showing abstract vs. concrete images of climate change impacts influenced perceived spatial and temporal distance (concrete images leading to a reduced distance), whereas hypothetical and social distance were not affected by the manipulation (Duan et al., 2019). Therefore, it might be more difficult to change perceptions related to the certainty of climate change, as well as what kind of people would be impacted.

Empirically, certain dimensions tend to be more clearly related to the global construct of psychological distance than others. Among Taiwanese participants, spatial and

hypothetical distance had higher factor loadings to the latent construct of psychological distance (~.74 for both) compared to temporal and social distance (.55 and .60, respectively), suggesting hypothetical and spatial distance are stronger determinants of the overarching construct than temporal and social distance (Chen, 2020).

In sum, despite covariation in measurement or outcomes among the distances, empirical evidence warrants a multi-dimensional approach that makes use of the conceptual distinctions between different dimensions. The next section will illustrate how these are differentially linked to environmental variables.

2.4.2 Links to Environmental Outcomes

The different components of psychological distance are differentially linked to specific climate change outcomes. A study conducted among farmers in Iran (Azadi et al., 2019) revealed that adaptation responses (e.g., intentions to diversify crops and limiting chemical inputs) were predicted by lower perceived temporal distance, but not by other dimensions. It could be argued that the temporal proximity, which is a situational cue, calls for adaptation responses, which are highly specific and concrete in nature. The authors also note that these farmers were already experiencing climate change impacts and highly aware of the risks and severity, which might explain why other dimensions (e.g., hypotheticality, social and spatial distance) did not predict adaptation behaviour in this specific sample. In another study examining climate change engagement amongst Australian participants (Jones et al., 2017) the temporal and hypothetical (uncertainty) dimensions were the strongest predictors, followed by social distance, whereas the effect of spatial distance was non-significant. In the USA, another study focusing on support for climate adaptation policies Singh et al. (2017) found that hypothetical distance was the most important antecedent of support, followed by spatial, social, and temporal distance, respectively. The relatively minor impact of temporal distance was explained by an effect of value consistency over time,

wherein the support for policies was not affected by time frame for those already concerned about climate change impacts. Hence, it can be suggested that for correlational findings temporal distance appears as the strongest predictor for short-term adaptation responses to climate change, especially when the impacts are already present, whereas hypothetical distance becomes more important for long-term outcomes such as policy support.

Experimental findings similarly reveal differences in the way the four dimensions relate to environmental outcomes. For example, Rickard et al. (2016) found that manipulating four distances produce different effects. Specifically, impacts taking place at a higher temporal distance (51 vs. 5 years in the future) combined with lower spatial distance (New York City vs. Singapore, for American participants) resulted in the greatest mitigation policy support, especially among Conservative participants. The authors argued that the spatial proximity increased concern which, combined with temporal closeness, may have triggered alarmism and hopelessness, and as a result backfired. In contrast, the combination of spatial proximity and temporal distance seemed to trigger just the right amount of concern. Crucially, these findings reveal that dimensions might interact with each other, and cancel out the intended effects of reducing a single distance.

In sum, which dimension of distance is most influential depends on the population, research design (correlational vs. experimental) and nature of the target outcome (adaptation vs. mitigation). Specifically, correlational findings generally reveal a negative link between psychological distance and pro-environmental intentions whereas for experimental studies prior beliefs, political views, and proximity to and prior experience with environmental hazards seem to moderate the effect of distance framings. In general, adaptation responses were more likely to be motivated by temporal cues whereas mitigation responses could be strengthened by highlighting temporally distant impacts.

2.4.3 Temporal Pessimism and Spatial Optimism

Research revealed *temporal pessimism* and *spatial optimism* as common biases leading to discounting climate change and environmental issues. Temporal pessimism (“things will get worse”) pertains to the fact that individuals anticipate great environmental risks and more deteriorated conditions for the future (as shown in a comprehensive study across 18 countries; Gifford et al., 2009). Similarly, serious consequences of climate change are predicted to happen in the remote future (e.g., in at least 45 years from the present date; Leiserowitz, 2005). Hence, temporally closer threats may not elicit the targeted levels of concern thus temporal pessimism may hinder the effects of psychological distance.

Spatial optimism refers to the fact that individuals generally disregard local environmental risks (“things are better here than there”), perceiving instead greater global risks (García-Mira et al., 2005). In Gifford et al.’s (2009) study, respondents worldwide evaluated a range of environmental qualities (waste management, air quality, biodiversity, population density, etc.) as a greater problem for distant places than for their own country – hence demonstrating spatial optimism. Similarly, Schultz et al. (2014) found cross-cultural evidence that people estimated higher levels of environmental risk on the global than the local level. In other words, the larger and more serious threats are perceived as more distant in space and time.

Importantly, these psychological constructions might explain why spatial localizing is not always effective and may produce the opposite of the intended results, since local issues are perceived as *less* severe. In one study, Chapman et al. (2016) observed a reduction in engagement when participants read about local climate change impacts, as opposed to impacts in geographically distant countries. Focus group discussions revealed that the local framing induced a perception of climate change impacts as trivial and decreased participants’ level of attention. This presents a paradox: construal level theory suggests that decreasing

distances is necessary for people to contextualize climate change; however, this also reduces the level of perceived risk (Leiserowitz, 2005) and, in turn, concern and willingness to act.

2.5 Moderators of Distance Framing: Political Ideology and Climate Change Beliefs

Although reducing psychological distance can affect acceptance that climate change is happening, it does not always affect risk perceptions, or behavioural intentions. Their effectiveness seems then likely to depend on other factors, primarily political orientation, and prior climate change beliefs. In this section, the moderating effect of distance framings by political ideology and climate change uncertainty, i.e., hypothetical distance, on climate change engagement will be described.

Previous literature suggests that people's prior beliefs about climate change, notably its degree of (un)certainly, can moderate the acceptance of information regarding climate change impacts. In one study, Corner et al. (2012) presented participants with two newspaper articles presenting high (vs. low) uncertainty of climate change impacts. Participants' environmental beliefs and climate change scepticism were assessed beforehand, and two groups (sceptic vs. non-sceptic) were created. Results revealed a biased assimilation effect: each group of participants evaluated the article that was in line with their personal views as more reliable and convincing than the opposing article. Interestingly, this effect was even stronger for the non-sceptics, who considered the sceptical article as particularly unreliable and unconvincing. This study also showed that biased assimilation occurred especially when articles appealed to political/moral reasoning rather than to scientific findings. This suggests that pre-existing beliefs on the certainty of climate change influence the perception of "subjective" information (i.e., moral reasoning and responsibility) more than "objective" information (i.e., scientific evidence).

Similarly, Kapeller and Jäger (2020) conducted a longitudinal study making use of repeated computer simulations to assess the impact of climate messages. Over time,

presenting dire climate change impacts continuously reduced willingness to behave pro-environmentally for those who were high on uncertainty and low on environmental self-identity (i.e., the propensity to define oneself as behaving pro-environmentally). Interestingly, repetitive messaging also led to an increase in the polarization of opinions.

Other studies have investigated the impact of personal environmental beliefs on the link between personal experience of climate change (i.e., social distance) and behavioural intentions (Broomell et al., 2015; Lujala et al., 2015; Whitmarsh, 2008). For example, with a longitudinal design, Myers and colleagues (2012) showed that people who had personally experienced some impacts of climate change at the first time of measurement (T1) reported stronger certainty beliefs at T2. The reverse relation between stronger certainty beliefs at T1 and personal experience at T2 was also supported by the data, which suggests a bidirectional link between the two variables. Importantly, the link from personal experience to certainty beliefs was especially strong for those participants who initially reported lower climate change engagement. Participants already engaged with the issue were less influenced by their subjective personal experiences. This provides evidence for motivated reasoning as well as the dynamic relationship between personal experience and belief in climate change (Myers et al., 2012).

Thus, pre-existing beliefs about climate change seem to influence the subjective evaluation of both external information, especially when moral or judgmental in nature, and one's own experiences. As such, they moderate the impact of hypothetical and social distances of climate change on people's concern and willingness to act. Hence, although distal framing could be ineffective to elicit greater concern and action among unconvinced individuals, it could be a very useful tool to promote behavioural consistency and reduce the attitude-behaviour gap among convinced or committed individuals.

2.5.1 Political Ideology

Political ideology is also a prominent moderator of distance framing effects generally (Roh et al., 2015), and similar effects are obtained when it comes to climate change perceptions. Liberals' opinions appear to be more stable and less reliant on distance framing than those of conservatives. For example, with USA participants Hart and Nisbet (2012) observed a beneficial impact of closer social/spatial distance (depicting climate change victims in New York versus in foreign countries) among conservatives whereas liberals strongly supported mitigation efforts regardless of the distance framing, and the effect among conservatives was mediated by a greater identification with the victims. Other studies found conservatives (but not liberals) decreased their willingness to act when the spatial distance increased (Chu & Yang, 2018; but see Duan et al., 2019).

Research suggests that conservatives' reaction to distance framing depends on the type of distance highlighted. Rickard et al. (2016) presented climate change impacts that varied in spatial distance (impacts for the USA versus Singapore) and temporal distance (impacts for 4, 31 and 60 years into the future, i.e., for 2020, 2047, and 2066, respectively). Liberals' support for climate policies was weakly impacted by the temporal and spatial framing. Conservatives' support depended on framing, but the temporal and spatial manipulation had different effects: the highest policy support was observed among American participants when the information presented high temporal and low social/spatial distance (in 2066 in the USA). It is possible that decreasing social/spatial distance makes the issue more personally relevant, hence increasing concern and willingness to take action, but that decreasing temporal distance creates a threat that exceeds the sense of personal efficacy (see Morton et al., 2011) and provokes a self-protection reaction (e.g., disengagement). Consistent with this idea, research has found that dire messaging in climate change campaigning could lead to climate change denial among participants with high system justification (Feinberg &

Willer, 2011). Also, a recent survey among an American sample found out that ideological attitudes of Right-Wing Authoritarianism (RWA) and Social Dominance Orientation (SDO) predicted belief in the anthropogenic climate change (Kerr & Wilson, 2021).

Studies in other cultural contexts have found that liberals react to framing manipulations. A recent study tested the effects of political ideology with Chinese participants from Singapore (Yang et al., 2020). Participants were shown Singapore and Maldives on a geolocation map on a computer screen and the subjective perceived spatial distance between two locations was manipulated by varying the size of the map. Conservatives' risk perception and policy support were not influenced by the manipulated lower spatial distance, whereas that of liberals increased.

Rickard et al.'s (2016) study revealed that political ideology was a significant moderator for an American sample but not for a Singaporean sample. Pro-environmental concerns are noticeably high among the Singapore public, which might have contributed to the different pattern of results (Detenber et al., 2016). However, taken together the inconsistent results from different studies seem likely to reflect the lower level of political polarization on climate change opinions among East Asian cultures compared to most Western countries, particularly the USA (McCright, 2009). Hence, it is expected that political ideology to play a stronger role most clearly in Western cultures wherein which climate change attitudes are very much linked to political opinions.

In sum, a key determinant of the impact of distance framing is likely to be the level of perceived threat for the self and relevant others (indirectly influenced by political ideology), which can increase either as a function of spatial/social or temporal distance.

The differences observed between liberals and conservatives could also be considered as reflecting value consistency over time. Increased temporal distance leads people to construe (future) issues in a more abstract and generalized way, and to focus on the "why"

(rather than the “how”) of action (Eyal et al., 2008). This leads them to act more in line with their values than is the case with temporally proximal issues. In contrast, for proximal issues, people consider the convenience of actions rather than their congruence with their own values. This may explain why higher distance framings increase the effect of the ideological gap between liberals and conservatives, the former polarizing their already favourable positions, and the latter sticking to their original, presumably less committed, position (McCright et al., 2016).

2.6 Specifying the Outcomes

An earlier section (2.4.2) gave evidence linking different dimensions of psychological distance to different outcomes. Research also has focused on environmental outcomes that range from risk perception and pro-environmental attitudes to intentions and behaviour. However, these are not influenced to the same extent by distance framings. This section focuses on those differences.

Risk perception seems to be the variable most susceptible to distance framing. Specifically, the perception of personal risk increases when distance decreases (Guillard et al., 2019). However, this does not always translate further into attitudes and behaviour. For example, Busse and Menzel (2014) found a social distance manipulation affected risk perception but not willingness to engage in pro-environmental behaviour. Similarly, Spence and Pidgeon (2010) found that mentioning local impacts produced higher risk perception and fear but had no effect on attitudes towards mitigation policies. In addition, perceived severity of global climate change impacts (in developing countries) was related to action intentions but not to environmental concern, whereas perceived severity of local impacts was related to both variables. Chen (2020) also found that psychological distance, albeit negatively related to environmental concern, did not predict self-reported pro-environmental behaviours among Taiwanese participants.

Hence, greater concern does not seem to be the sole means of promoting action and might not even be the most effective. Indeed, research suggests that presenting too great a risk negatively impacts feelings of efficacy, which is a crucial predictor of action intention (Bamberg et al., 2015). In line with the spatial optimism phenomenon, Busse and Menzel (2014) observed lower perceived behavioural control and increased feelings of helplessness when socio-spatial distance increased. It was similarly proposed that framing pro-environmental goal abstractly decreased subjective outcome expectancy and led to the perception that an increasing number of participative individuals was necessary to reach the goal (i.e., higher cumulative effort), which then led to disengagement and lesser pro-environmental intentions (Moussaoui & Desrichard, 2016).

Finally, different types of pro-environmental behaviour are also differentially impacted by different levels of psychological distance. Authors often distinguish between support for mitigation policies, which represents a broader and probably more abstract type of behaviour, and individual pro-environmental action, which represents a more concrete type of behaviour. Research supports the idea of a fit between the targeted behaviour and the psychological distance highlighted, so that decreased distance is more effective to promote specific individual action whereas increased distance might prove more effective to promote global action. For example, a study among California's Central Valley farmers showed that willingness to adopt specific adaptation methods (e.g., new irrigation practices) was more strongly predicted by perception of local risks of water sources availability, while general mitigation intentions (e.g., lower carbon output) were more strongly predicted by perception of global water risk (Haden et al., 2012). This suggests that adaptation and mitigation strategies are represented at different construal levels.

In conclusion, more abstract and higher-level representation of global warming could potentially be very important to promote intentions to mitigate, which constitute a more

comprehensive and long-term approach to climate change than adaptation strategies (Evans et al., 2014). On the other hand, promoting adaptation by presenting explicit coping strategies could also foster support for mitigation actions. For example, Greenhill et al. (2018) found that presenting a proposed gasoline tax with adaptation costs (vs. with dire impacts of failure to mitigate) resulted in greater support, especially when the information about costs was more detailed. Hence, the right combination of highlighting short-term gains in combination with long-term, value-based solutions might be the most effective method (Haden et al., 2012).

2.7 Discussion

So far, this chapter has examined and organized the evidence related to the relations between psychological distance (hypothetical, temporal, social and spatial) and people's climate change-related attitudes and behaviours. In this section, the evidence will be examined as a whole and its implications for strategies to promote action to mitigate climate change will be discussed. It is important to consider that for policy to change the decision makers are likely to want to be confident that they have public and political support. Psychological framing has the potential both to affect how policy is considered and the support that underpins it.

Overall, the correlational evidence negatively relating psychological distance to concern, and mitigation intentions is consistent across studies. Higher spatial, social, temporal, and hypothetical distance from climate change impacts is linked to lower climate change engagement and policy support. Hypothetical distance furthermore appears as the strongest determinant of these environmental outcomes. The experimental findings regarding the impact of distance framings (mostly spatial and temporal), however, portrays a more complex picture. Temporal pessimism, i.e., tendency to perceive lower risk in the near (vs. far) future, and spatial optimism, i.e., tendency to assume minimal risk in the proximate (vs. distant) environment, may inhibit the positive effect of lowering psychological distance. This

creates a dilemma where construal level theory proposes benefits of lowering distance to increase relevance, whereas risk and concern might be lower for near future and locations because of such cognitive biases. There are other factors which could explain the complexity of evidence concerning framing effects. The first is the methodological variability among distance manipulations. In some studies, distance was manipulated implicitly, for example through changing distance between two locations in a map. Other studies explicitly mentioned spatially distant (vs. closer) impacts (i.e., through newspapers and images) to manipulate the proximity of the impacts. Some of those texts highlighted dramatic or dire aspects of climate change, or portrayed people as well as nature as victims, which arguably taps into different psychological constructs (i.e., empathy, concern, anxiety) than simply highlighting geographical distance between two countries. These differences may account for complicated pattern of results concerning the impact of distance manipulation.

Proximate messages containing dire language and emphasizing high levels of threat, as well as moral responsibility in climate change mitigation, might only be effective in motivating climate change engagement for those who already have strong pro-environmental attitudes (e.g., who endorse left-wing political ideology), whereas it may lead to defensiveness and denial among those who have incongruent low environmental concern (e.g., individuals with politically conservative worldviews and high levels of system justification) (see Figure 2.1 for a conceptual summary of the findings on political ideology).

In line with this idea, to motivate engagement among those who are low on concern and to avoid value-message discrepancy, and political polarization it is likely to be more effective to highlight scientific facts than to focus on moral implications. To overcome apathy and dismissive attitudes, it is also essential to consider efficacy considerations. Projection of proximal negative impacts should be presented with potential solutions and practical

suggestions to prevent avoidance and denial, especially for those who are defensive and politically opinionated about climate change.

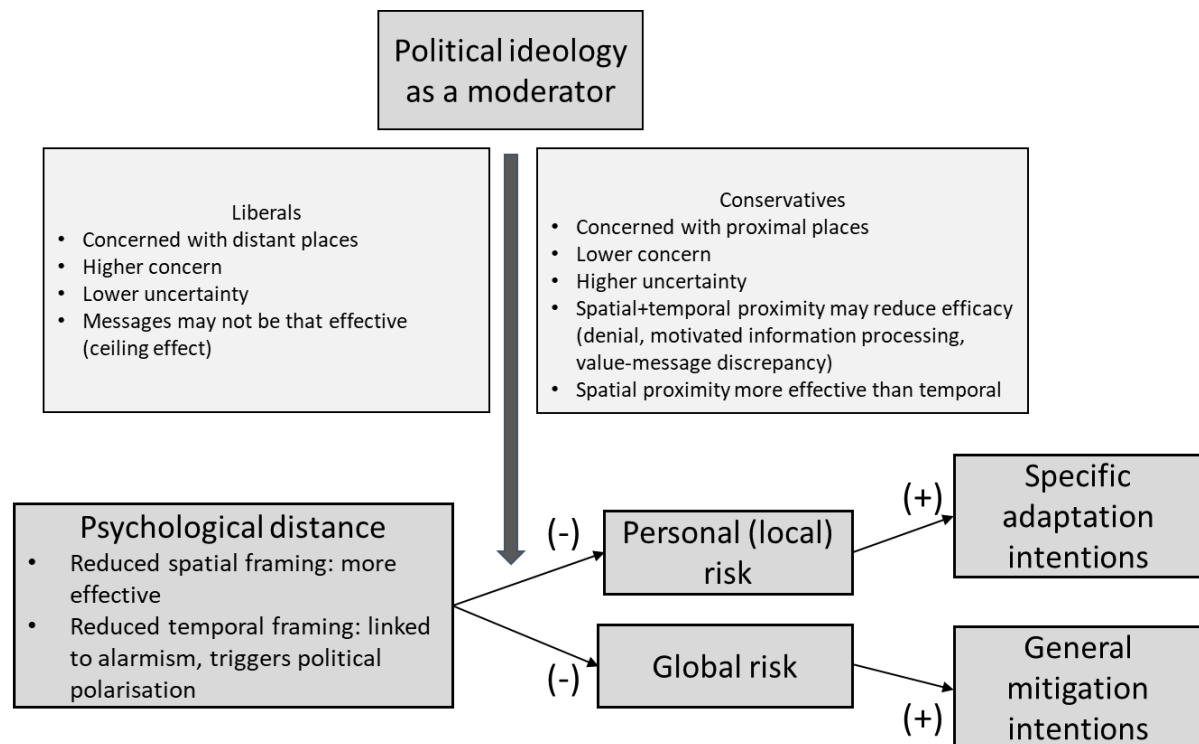
2.7.1 Mitigation vs. Adaptation

Local and global impacts of climate change may motivate concern and action at specific relevant levels, due to their representation at different levels of construal. Climate change adaptation, which refers to localized and specified set of behaviours, is motivated by local framing. On the other hand, mitigation behaviours, which relates to longer term plans to combat climate change and are represented at a more abstract level, are encouraged by global impacts. This is expressed in McDonald et al.'s (2015) suggestion that distant and more serious impacts should be included to environmental campaigning to promote long-lasting solutions.

2.7.2 Political Ideology

The literature reveals a complex picture regarding the role of political ideology as a moderator. Climate change scepticism (i.e., hypothetical distance) is positively related to political conservatism, predominantly for the USA and partially for other Western European countries. In general, liberals' attitudes and intentions tend to be robust to distance framings whereas conservatives' pro-environmental intentions often decrease with distant framing. Also, conservatives are more likely to be concerned with impacts that are local; however, highlighting temporal proximity might backfire as it triggers denial and avoidance from the issue (Rickard et al., 2016; Roh et al., 2015). Evidence showing higher attitude gap between liberals and conservatives for projections concerning the remote future is also consistent with the notion of value-action congruency for psychologically distant framings. Also, the nature of political ideology and its attitudinal components might differ across Eastern (vs. Western) cultures where cultural (vs. economic) aspects of conservatism are emphasized to a greater degree. (Dalton, 2006). Moreover, as mentioned above, not all types of psychological

distance manipulations produced the same effect in terms of political polarization (see Figure 2.1 on the summary of past literature on the interaction between political ideology and distance framing). Future studies may want to explicitly test whether different techniques might be responsible for the heterogeneity in the findings.

Figure 2.1*Political Ideology as a Moderator of Distance Framing*

Note. The figure focuses on political ideology as the most studied moderator of psychological distance framing.

2.8 Conclusion

To conclude, although some research has presented lower psychological distance as a consistent driver of climate change concern and action, several key variables moderate the impact of framing psychological distance. Principal among these is political ideology, and prior beliefs on climate change. Furthermore, the hypothetical, temporal and social/spatial dimensions of psychological distance are all intertwined to an extent. This makes it harder to assert with confidence that a particular manipulation affects only a certain aspect of distance. In addition, reducing distance may increase anxiety and risk perceptions but fail to motivate action, notably due to dampened efficacy beliefs.

The implication is that alarming messages that insist of the urgency of the situation for the here and now, and in addition highlight high human responsibility in these impacts might increase action intentions only amongst those who are already convinced and concerned about the issue (particularly liberals). However, such approaches may prove ineffective amongst people whose worldviews are incongruent with the message (particularly conservatives). Messages that simultaneously decrease temporal distance and uncertainty of climate change impacts may even backfire if they do not simultaneously promote efficacy and offer solutions to the problem (Feinberg & Willer, 2011; see also Brügger et al., 2015). Hence, when determining a framing for information on climate change impacts, the different distances should be combined (some high, some low) and adapted to the target audience, so that the resulting impression is that of a serious but addressable issue. The framing of climate change is interwoven with challenges and complexities. Therefore, campaigners and policy advocates should pay attention to the characteristics of the audience, nature, and scope of the problem and necessary level of action, by highlighting potential solutions, and possibilities for effective action. Further research is needed to explore more comprehensively the interdependence between different dimensions of psychological change, and to identify the role of each dimension for climate change mitigation.

Chapters 1 and 2 identified the key variables determining environmentalism and pro-environmental behaviour in general. Values, beliefs, moral foundations, political orientation, moral foundations, and psychological distance appeared as main factors in determining pro-environmental behaviour and climate change engagement. Past research also identified the main determinants of environmental activism, which are collective and participative efficacy, identification with the movement, and collective emotions (Bamberg et al., 2015; Rees et al., 2014). However, several key determinants of individual pro-environmental behaviour addressed in Chapter 1 (political ideology, environmental responsibility, moral foundations,

and psychological distance) were not examined in relation to environmental activism. Hence, the present thesis attempts to address this gap by introducing these variables into collective environmental action models as distal determinants of climate change activism. Perceived responsibility and psychological distance were manipulated experimentally, whereas moral foundations and political ideology were measured. The present thesis adopted a twofold approach, utilising both experimental and correlational design across 4 studies. This approach allowed the causal role of responsibility and psychological distance framings in determining environmental activism intentions to be examined, which has not been the focus of the past research. The correlational part, on the other hand, was used to test the proposed links between constructs on the current path model. Combining these two approaches also allowed to test the model configuration across conditions. However, this double approach could also present some limitations. To begin with, experimental manipulation might have introduced unwanted error into variables on the path model. To overcome this limitation, path model test is repeated across conditions for each experiment, which lowered the sample size thereby limiting the statistical power. However, since a control group without an experimental manipulation was not used for any of the studies, it is difficult to confirm whether observed path model configurations are attributable to manipulations. Moreover, for Study 4, a direct comparison of the path model was not feasible, as the measures differed across conditions.

The present thesis focussed on the specific independent variables (i.e., experimental manipulation) across 4 studies. Study 1 examined the role of group-based responsibility, whereas other studies focussed on the psychological distance from climate change. Perceived responsibility is chosen as the main independent variable in Study 1 since attribution of responsibility to the self or to ingroup is a key determinant of environmental behaviour and concern (Jang, 2013; Olausson, 2009; Stern, 2000). The psychological distance from climate change is chosen for the other studies as the independent variable. Hence, the transition from

1st to 2nd study entailed shifting focus from the responsibility framing to the distance framings. This route was followed primarily due to a relatively small effect of the responsibility manipulation on dependent variables. Secondly, a wide array of research identified psychological distance as a unique impediment to climate activism, warranting a detailed consideration. Also, psychological distance from climate change is stated as an obstacle to belief in personal responsibility and agency in battling climate change, suggesting that perceived distance determine responsibility beliefs (Markowitz & Shariff, 2012). In addition, since perceived responsibility is a dimension of environmental beliefs according to the VBN model, the past research focused on responsibility as a predictor of pro-environmental attitudes and behaviour (Taylor et al., 2014) whereas perceived distance from climate change is examined as the outcome of framing (Jones et al., 2017; McDonald et al., 2015) leading to a theoretical gap in the literature. Hence, across studies 2-4, rather than extending upon results of Study 1 and examining responsibility beliefs in more detail, psychological distance was chosen as the main independent variable as a key factor in climate activism.

2.9 Outline of the Following Chapters

Chapters 1 and 2 identified the common predictors of environmentalism. The following chapters will present findings of four experimental studies testing the effect of different frames on environmental activism intentions among British citizens. Chapter 3 focuses on the role of responsibility, whereas Chapter 4 examines the role of distance framings in motivating environmental activism. In Chapter 5, the air pollution frame is tested whether it is in motivating environmental activism than climate change frame.

More specifically, Chapter 3 addresses the role of intergroup responsibility framing in the national context on environmental activism intentions and associated collective action variables. In addition to the experimental design, an integrated path model of collective

action is employed. Three additional variables, i.e., national identification, sense of community and environmental concern, which were identified as influential predictors of pro-environmental engagement in the past research, are linked to collective action variables.

Chapter 4 tests how distance framings impacted climate activism intentions with two experiments. Study 2 examines the impact of temporal distance and hypothetical distance (uncertainty) framing, whereas Study 3 compares how distal and proximal depictions of climate change impact motivated activism intentions. Both Study 2 and Study 3 utilise an extended path model of collective action with perceived psychological distance as the main predictor. Study 3 also includes risk perceptions, and activism intentions at the local and the global level into the path model and tests how distance manipulations are linked to these variables. Political ideology and environmental concern are also included into the path model alongside perceived distances. Employing a path model allows comparison of the unique contribution of each dimension of perceived psychological distance in predicting risk perceptions and environmental outcomes.

Chapter 5 describes how an alternative narrative of environmental issues, i.e., air pollution, compares to climate change framing in terms of motivating activism intentions and group-based environmental variables. Finally, Chapter 6 summarises empirical findings and discusses theoretical and practical implications, links to previous findings in the literature, limitations, and offers directions for future research.

Chapter 3: The Role of Responsibility Framing and Moral Foundations and in Environmental Activism

3.1 Chapter Overview

This chapter presents findings of Study 1, which examined the role of ingroup vs. outgroup responsibility and moral foundations in motivating pro-environmental collective action intentions among British citizens. There are two main research questions addressed. Firstly, an extended framework was employed where the Social Identity, Relative Deprivation, collective Efficacy (SIRDE) model (Grant et al., 2017) was used as theoretical starting point. Secondly, the impact of responsibility framing on collective action variables were examined. Hence, in the present study, both correlational and experimental designs were utilised.

Although past research examined moral foundations in the context of environmental engagement, there was no prior study testing a framework of environmental activism integrating moral foundations. The modified path model in Study 1 included moral foundations as predictors, along with national identification, sense of community and environmental concern, which were identified as influential in determining environmentalism in the past literature. Support for system reform, which was adapted from social change beliefs in the SIRDE framework to fit with the context of climate action, was included in the model as a central variable.

The main experimental finding is that presenting ingroup responsibility concerning environmental degradations (vs. outgroup responsibility) elicited lower endorsement of harm and justice foundation, British identification, and support for system reform although there was no difference in activism intentions or other group-based variables. For the path model, ingroup responsibility manipulation was not embedded in the path model as it was not measured explicitly, instead it was treated as a multilevel variable. The results of path model

test revealed rather poor fit although links between variables partially supported the predictions. Specifically, participative efficacy, i.e., belief in the positive impact of one's individual contribution, was the strongest predictor of action intentions. The effect of moral foundations in the model was not so central. Support for system reform was a strong predictor group-based variables, most prominently emotions, followed by movement identification and efficacy. Participative efficacy was the strongest predictor of activism intentions, followed by movement identification and group efficacy, whereas collective emotions did not predict activism intentions.

3.2 Introduction

Psychological determinants of pro-environmental behaviour are widely studied within social psychology (Gifford & Nilsson, 2014). Several theoretical models such as Value-Belief-Norm Model (VBN) and Theory of Planned Behaviour (TPB) were utilised to explain pro-environmental behaviour (Bamberg et al., 2015; Stern, 2000). These models proved useful for explaining different kinds of private-sphere pro-environmental behaviour but less so when it comes to environmental collective action (Stern, 2000).

Collective pro-environmental action was considered central to tackle global environmental problems such as climate change (Ostrom, 2010). Past research on environmentalism showed feeling responsible for environmental damage as a key motivator for pro-environmental engagement (Stern et al., 1999). Perceived group-based responsibility for environmental degradation leads to higher environmental guilt and pro-environmental engagement (Mallett, 2012). Guilt induced by ingroup environmental wrongdoing was a key emotion driving collective pro-environmental behaviour, whereas the role of anger was not so central (Rees et al., 2015). However, the role of outgroup responsibility in environmental damage was not examined in these pieces of research. Hence, the present study examined the

effect of highlighting ingroup vs. outgroup responsibility in motivating activism intentions utilising an experiment by also incorporating the moral foundations.

Moral foundations are linked to a variety of value orientations, political ideology and attitudes towards the environment, and climate change beliefs (Bliuc et al., 2015). Previous research examining moral foundations within social identity framework found that individualising moral foundations predicted higher group consciousness, i.e., identification with the climate change believers rather than sceptics, which then predicted greater engagement in pro-climate political action and donation for mitigation of climate change (Bliuc et al., 2015). The present study aimed to identify the role of moral foundations on collective climate action intentions (e.g., willingness to participate in the activities of local environmental group) in a more systematic fashion while addressing other influential variables in the literature. Collective action variables (movement identification, efficacy and action intentions) were defined in relation to a local grassroots environmental group, which is arguably less politically polarising than social identity based on climate change beliefs, i.e., opinion groups (Hoffarth & Hodson, 2016).

Past research revealed that large-scale mobilisation is central to mitigation of climate change (Ockwell et al., 2009). Hence, the main outcome of the present study is environmental collective action intentions. Two collective action frameworks will be utilised for the current study. The Social Identity Model of Collective Action (SIMCA: Zomeren et al., 2008) is a widely used framework of collective action in the literature, and it was also effective in explaining grassroots environmental activism intentions (Bamberg et al., 2015). SIMCA postulated that social identity motivates collective action through two distinct pathways, i.e., motivational (emotions) and instrumental (efficacy) (Zomeren et al., 2008). In addition, the Social Identity, Relative Deprivation and collective Efficacy Model of Collective Action (SIRDE: Abrams & Grant, 2012) proved to be effective framework in explaining political

activism intentions. The SIRDE model introduced social change beliefs, which refers to endorsement of fundamental change in the status quo, as a central variable motivating collective action. In the environmental domain, structural change in the power distribution is a crucial component to accomplish long-term solutions to environmental degradation (Whitmarsh et al., 2011).

Mitigation of the most prominent environmental problems such as climate change requires large-scale societal cooperation, i.e., environmental *collective* action (Kilbourne & Pickett, 2008; Ockwell et al., 2009). Recent research suggested that collective pro-environmental behaviour is predicted more strongly by group-based variables, e.g., strength of one's networking with environmentalist groups, and identification with an environmentalist group, than by personal attitudinal variables such as environmental concern (Ando et al., 2010; Dono et al., 2010). Thus, to examine collective action intentions in the environmental domain, the present study will Social Identity Model of Collective Action (SIMCA: van Zomeren et al., 2004) and the Social Identity and Relative Deprivation Model of Collective Action (SIRDE: Grant et al., 2017) which were effective in explaining collective action intentions and behaviour in different contexts. SIMCA was used to formulate the links between group-based variables. In terms of theoretical foundations, the group-based/collective variables previously identified as drivers of environmental collective action will be presented. Then, more individual level variables will be described.

3.2.2 Group-Based Determinants of Environmental Action

3.2.2.1 The Instrumental Pathway to Collective Action: The Role of Participative Efficacy

Several collective action models have been successfully utilized to explain collective behaviour in the environmental domain (Bamberg et al., 2015; Dono et al., 2010; Lubell, 2002). To begin with, collective interest model by Lubell (2002) focuses on the role of

explicit cost-benefit analysis. Group and self-efficacy, environmental concern, political ideology, and demographics explained around 30% of the variability in activist behaviour, where participative efficacy (i.e., the belief that one's own action will make a difference) was the strongest predictor (Lubell, 2002). This model incorporated cognitive (i.e., risk perception) and instrumental (i.e., efficacy) aspects, not considering motivational elements, e.g., social identification and environmental collective emotions such as guilt and anger. The model also posits that the actual behaviour is determined mainly by cost-benefit analysis and participative efficacy beliefs whereas behavioural intentions were not, highlighting the discrepancy between intentions and behaviour (Lubell, 2002). Efficacy pathway was also framed as a "problem-focused coping" mechanism leading to collective action (van Zomeren et al., 2010). More recent research revealed that "participative efficacy" predicted collective action intention more strongly than self-efficacy and group efficacy. Specifically, it was shown that participative efficacy was more effective than group efficacy in predicting the intention to sign a petition among university students in response to financial cuts on higher education (van Zomeren et al., 2013). The dominant role of participative efficacy seems to contradict the importance of group-based variables in environmental activism. However, participative efficacy pertains to effectiveness of one's actions within a group, hence, it has a collective component in addition to a personal aspect.

3.2.2.2 The Motivational Pathway to Collective Action: Emotions and Social Identity

Other frameworks such as dual pathway model of collective action, focused on both motivational (i.e., emotions and social identity) and instrumental variables (i.e., efficacy) (van Zomeren et al., 2010). SIMCA proved to be a reliable framework of collective action across different samples such as college students signing petitions to oppose financial cuts by government on educational expenses, and Greenpeace activists protesting the use of genetically modified meat in food products (van Zomeren et al., 2012). Specifically,

experimentally induced fear from climate crisis and group efficacy, but not self-efficacy, independently predicted action intentions. It is worth noting that SIMCA was originally formulated to focus on collective anger targeted a specific outgroup, as the goal of the collective action was to remedy the collective disadvantage caused by the outgroup (Zomereren et al., 2008). However, van Zomereren et al. (2010) proposed to change the emotional component to fear to better fit the characteristics of the environmental crisis. Other studies extended the dual pathway model of collective action to include other group-based variables, resulting in social identity model of collective action (SIMCA: (Bamberg et al., 2015; Zomereren et al., 2004). SIMCA postulates that higher identification with a group predicts collective action to improve the situation of the group, through group-based efficacy and emotions (i.e., anger) pathways. Recent research on environmental action revised SIMCA by including collective guilt and sense of community, which also predicted climate action intentions, e.g., participation in a local environmental group (Rees et al., 2015).

3.2.2.3 Moral Responsibility, Guilt and Anger

Environmental problems and recommended solutions are frequently framed in the discourse of moral obligations (Täuber et al., 2015). Indeed, personal moral norms, i.e., responsibility to behave prosocially, predicted greater engagement with a diverse set of non-activist pro-environmental behaviours (Stern et al., 1999). A review of determinants of recycling behaviour found that in developed nations moral responsibility was a stronger predictor of recycling than cost-benefit analysis, and it was proposed that material (extrinsic) incentives to recycle might diminish PEB by impairing moral (intrinsic) motivation (Thøgersen, 1996). Research also documented that when participants' ingroup (i.e., country) was portrayed as morally responsible for environmental wrongdoing (vs. pro-environmental actions) participants expressed higher environmental anger and guilt. In turn, guilt led to reparative actions, which refers to behaviours aiming to repair the damage, whereas anger led

to restorative action, i.e., punitive action towards the wrongdoers in order to restore the balance (Harth et al., 2013). Similarly, confronting with higher (vs. lower) personal carbon footprint than the U.S. average led to higher guilt but not shame and anger among the U.S. participants, where collective guilt positively predicted support for a pro-environmental group (Mallett et al., 2013).

However, highlighting moral responsibility associated with environmental problems may lead to negative self-evaluation which might lead to dismissive or denying attitudes. For example, presenting climate change as a man-made (vs. natural) phenomenon having minor (vs. major) impacts led to greater guilt and willingness to engage in energy conservation and to pay green taxes (Ferguson & Branscombe, 2010). Another potential outcome of morality-based messages is deflation of responsibility to an outgroup and lower levels of willingness to contribute to the environment, specifically for those that identify strongly with the ingroup (Täuber & van Zomeren, 2013). Most importantly, moral framing can be effective when the values of the recipients of the message align with the values highlighted in message, described as value-identity fit. Specifically, moral responsibility can be promoted based on personal values and identifications, e.g., national identity (Kutluca et al., 2016). Indeed, other studies have shown that when the language of environmental messages is tailored according to one's political ideology, the message is more likely to motivate people to donate to an environmental movement (Christopher et al., 2016). Therefore, the impact of responsibility messages and pro-environmental intentions might be moderated by political orientation and social identifications (Feinberg & Willer, 2013). Research also showed that when presenting environmental messages, the scale of the impacts should seem manageable to motivate action, i.e., not impair feelings of self and participative efficacy. Therefore, presenting uncontrollable and large-scale environmental impacts of human activity consequences may lead to dismissiveness or denial of environmental problems or of the personal responsibility

in mitigating those (Ferguson & Branscombe, 2010). In sum, although perceived responsibility is central to pro-environmental conduct, individuals' value systems and ideology, and efficacy beliefs should be taken into consideration when framing environmental messages.

Research also showed that higher guilt due to environmental responsibility led to greater willingness to act and identification with an environmental group (Mallett et al., 2013). However, guilt due to individual actions may not encourage subsequent pro-environmental behaviour, arguably due to the smaller significance of the guilt-inducing events (Bissing-Olson et al., 2016). Researchers suggested that reminding personal actions are less effective than reminding collective and larger-scale behaviours to elicit guilt, in line with the collective approach to pro-environmental behaviour. Hence, the perceived ingroup responsibility was found to be effective in promoting pro-environmental intentions largely examined in the previous literature but outgroup responsibility, which the present study aims to identify, was given less of a focus.

3.2.2.4 Fear Appeals and Efficacy

In terms of fear, highlighting the dire outcomes of climate change led to higher levels of action intentions through increased fear (van Zomeren et al., 2010). However, presenting major impacts may backfire because of the denial of environmental problems, a mechanism similar to guilt (Feygina et al., 2010). Even when dire messages increase anxiety or worry, these emotions may not predict willingness to mitigate climate change (Ferguson & Branscombe, 2010). Images inducing fear are frequently used in environmental campaigning but found to be ineffective in generating climate change engagement (O'Neill & Nicholson-Cole, 2009). Previous research suggested that anger would be a more prominent emotion when there is an outgroup to blame which is hardly the case in global issues such as climate

change (van Zomeren et al., 2010). On the other hand, seeing ingroup as responsible for environmental harm was shown to increase ingroup directed anger (Harth et al., 2013). However, the link between perceived responsibility and outgroup directed anger was not established in the literature.

In sum, guilt was found to be the predominant emotion driving constructive, pro-environmental intentions, providing it does not impair feelings of efficacy. Previous research addressed the role of guilt in the context of pro-environmental behaviour due to responsibility assumed for inflicted damage, whereas evidence concerning fear and anger is mixed, some pointing out to counterproductive effects of fear appeals. In the present study, role of group-based emotions on environmental activism intentions will be examined. It is hypothesised that highlighting ingroup responsibility will result in higher guilt and intentions to take part in environmental collective action. Fear and anger were also examined in relation to responsibility framing as well as how they are linked to other pro-environmental outcomes.

3.2.2.5 Support for System Reform (Social Change Beliefs)

Social change beliefs, which refer to endorsement of large-scale change in societal structures and institutions to achieve a desirable outcome, were formulated and tested within the social identity, relative deprivation, and collective efficacy (SIRDE) model of collective action (Grant et al., 2017). The SIRDE model postulated that cognitive relative deprivation, i.e., perceived disadvantage of the ingroup compared to the outgroup, and identification with the ingroup, predicted affective relative deprivation, i.e., anger towards the outgroup and collective efficacy. These in turn positively predicted belief in social change and collective action intentions. Research found that social change beliefs largely explained the political behaviour to improve the condition of the ingroup. Specifically, higher levels of Scottish identity predicted greater feelings of frustration due to social inequality (i.e., relative

deprivation), collective efficacy to overcome social inequality, and support for separation of Scotland from England (i.e., social change beliefs), which then positively predicted intentions to vote for the separatist party (Grant et al., 2017). The model was also utilised to explain protest intentions among skilled immigrants in Canada. Specifically, status insecurity and Canadian identity among immigrants predicted greater perceived discrimination (cognitive collective relative deprivation (CRD)) and intergroup anger and frustration (affective CRD), which then led to collective efficacy and protest intentions to improve the conditions of skilled immigrants (Grant et al., 2015).

Research implied local grass-roots movements and “bottom-up” initiatives play a key role in transition to a low-carbon living and mitigation as they have the potential to politicise environmental problems and influence national policy (Mihaylov & Perkins, 2015). Hence, in the context of climate change mitigation, it can be suggested that social change beliefs, which pertain to the redistribution of power to local authorities and deep-seated policy changes to prioritise environmental issues, are central (Ockwell et al., 2009). Thus, social change beliefs related to the decentralisation of power will be incorporated into our extended collective action model.

Conceptually, social change beliefs were operationalised at the similar level of specificity to action intentions and directed towards a certain behaviour (i.e., supporting national separation) in the SIRDE model (Grant et al., 2017). However, for the present study, general beliefs related to societal level change in response to environmental problems, such as locally focused mitigation efforts and policy focus were examined, rather than details of such kind of change, which was the case in previous studies testing the SIRDE model. Hence, it is hypothesised that social change beliefs would precede group-based variables in our model, due to less specific nature of the construct compared to group-based variables. In other words, the SIRDE model was developed to explain collective action in contexts where

there is a clear distinction between the disadvantaged ingroup and an outgroup (i.e., England and Scotland), and collective action was motivated by power and status inequality between groups. There are a multitude of actors involved in the emergence of, as well as proposed solutions to global environmental problems such as climate change (Ostrom, 2010). In the present study, when applying the SIRDE model to environmental activism, social identity was operationalised as identification with an environmental group. Hence, in the present study, a new construct inspired from the notion of social change beliefs was incorporated into the SIRDE model and it was reframed as “support for system reform” to fit the domain of environmental behaviour.

3.2.2.6 Sense of Community

Sense of community, also referred to as neighbourliness, can be defined as feeling of belonging to one’s close neighbourhood or community. Corresponding to other forms of social identity, it has distinct components such as inclusivity (feeling as a part of one’s neighbourhood), ingroup identification (perceiving neighbourhood as an integral part of self-concept) and entitativity (shared meaning of group membership) (Wager & Abrams, 2009).

Neighbourliness is bidirectionally linked to healthy communication with and feelings of inclusion into the local community, hence promoting a reciprocal trust and fostering relationships (Abrams, 2006). Indeed, sense of community/neighbourliness was measured as a proxy for social identity and it was found to predict environmental activism intentions, e.g., taking part in the environmental activities of a local grassroots group (Rees & Bamberg, 2014). In the present study, environmental group identification was a proximal predictor of action intentions, whereas sense of community, a less specific form of identification with one’s local environment, was modelled as a distal predictor of group-based variables in the model.

3.2.2.7 National Identification

National identification, i.e., belongingness to one's nation, is a form of social identity which encompasses relevance of group membership to personal identity, seeing oneself as a prototypical member, and positive evaluation of the ingroup (Mummendey et al., 2001). Past literature identified a moderate positive link (.28) between national identity and right-wing ideology, as well as system justification, where the latter two predicted lower environmental concern among American participants (Feygina et al., 2010). Research also documented mobilising influence of national identity among minority groups. For example, national identity, and cultural identity, predicted greater perceived discrimination and collective efficacy to increase the level of employment status among skilled immigrant workers in Canada (Grant et al., 2015). National identity also motivated the voting intentions for a separatist party for Scottish youth to gain national independence, an effect mediated by greater endorsement of social change beliefs and feelings collective relative deprivation (Grant et al., 2017).

These studies focused on action intentions directly linked to national identity, that is, collective relative deprivation and separatist beliefs. Although in the present study, environmental problems are not directly linked to national identity, the experimental manipulation highlighted ingroup/outgroup (i.e., country of citizenship/another country) responsibility concerning environmental degradation. Hence, national identification was also included into the path model to test whether it would impact how the message is received by people on different levels of identification. That is, national identity was treated both as a proxy for political ideology and as a potential moderator for responsibility manipulation. Past literature identified two aspects of social identity, i.e., ingroup glorification and ingroup attachment, which were linked to lower and higher willingness to accept responsibility for ingroup wrongdoings, respectively (Roccas et al., 2006). Previous studies documented the

paradox of group-based guilt. That is, those prouder of their nationality were more reluctant to accept its wrongdoings (e.g., violence towards outgroups) and feel guilty, hence more defensive towards responsibility message. Similarly, other studies have found that people who are high (vs. low) on ingroup glorification are more likely to morally disengage from the negative actions of the ingroup, perceive less damage to the outgroup, and express lower demand for reparative justice (Leidner et al., 2010). Since national identification was measured both in terms of glorification and attachment components in the present study, the role of national identification in moderating the effect of responsibility framing will be explored more openly.

3.2.3 Individual Determinants of Environmental Action

3.2.3.1 Moral Foundations

Moral foundations theory (MFT) postulates that moral intuition is multi-dimensional with five central components (i.e., harm, justice, loyalty, authority, and purity) (Graham et al., 2009). These are grouped into individualizing and binding foundations, endorsed more strongly either by liberals or conservatives, respectively. Hence, political orientation, which is a strong predictor of environmental concern, is closely linked to moral foundations (Graham et al., 2009). Research also documented direct links between moral foundations and pro-environmental intentions. For example, care and justice foundations were linked to positive view of Green party as well as personal conservation behaviour (Milfont et al., 2019). A qualitative study revealed that care and concern for younger generations and justice considerations were the core motivations among environmental activists (Jia et al., 2017). Environmental protection is frequently portrayed in relation to responsibility towards nature such that care and justice are the essential values that are governing the relationship between human beings and the environment (Chan et al., 2016). Indeed, environmental campaigning messages usually contain on harm/care-based moral appeals (Feinberg & Willer, 2013).

Purity foundation could also be a potential driver of pro-environmental action such that in many civilizations and cultures, the elements of nature are considered as "sacred" and "pure", and environmental degradation is generally associated with violation of the nature's purity (Rottman et al., 2015). Past literature also revealed that moral foundation predicted collective action in the relevant domains (Milesi & Alberici, 2018). Harm foundation predicted activism intentions against violence towards women, whereas collective action intentions about water supply equality were predicted by justice foundation.

In sum, care, justice, and purity foundations were highly emphasized in environmentalist discourse. Therefore, it is predicted that there will be a positive relationship between care, justice and purity foundations and collective action intentions, as well as environmental concern.

3.2.3.2 Environmental Beliefs/Concern (NEP)

Environmental beliefs (as captured by the New Ecological Paradigm (Dunlap et al., 2000) are identified as the outcome of value orientations, and a driver of prosocial norms in the Value-Belief-Norm model (VBN: Stern, 2000). Previous research used NEP to assess concern either as an outcome or an antecedent to pro-environmental behaviour/intentions (García-Valiñas et al., 2012). NEP encompasses belief in fragility of nature of and serious environmental damage due to anthropogenic activity (Dunlap et al., 2000). Among diverse samples environmental concern as measured by NEP predicted activism intentions (Fielding et al., 2008) and public sphere pro-environmental behaviour (X. Liu et al., 2018).

3.2.3.3 Environmental Concern and Moral Foundations

Research showed that endorsement of environmental concern was positively related to harm and care, and negatively linked to purity, loyalty, and authority, but pro-environmental behaviour (i.e., lower meat consumption) was not linked to moral foundations, suggesting

moral foundations are more distal predictor (Springer, 2013). Another study in Sweden confirmed a moderate positive link between individual foundations (care and justice) and NEP but failed to find such a relationship for binding foundations (purity, loyalty, and authority) (Jansson & Dorrepaal, 2015). Also, NEP was more strongly linked to problem awareness and personal norms concerning climate change mitigation than moral foundations. Hence, although studies point out to positive influence of individualising moral foundations on pro-environmental engagement, the independent contribution of NEP and moral foundations to environmental outcomes need further examination. Thus, the present study aimed to disentangle the role of moral foundations and NEP in explaining environmental collective action variables.

3.3 Study 1

The present study will involve a double approach, utilising both an experimental manipulation and a correlational design (i.e., a path model). The experimental manipulation allowed to test the impact of responsibility framings on collective action variables. On the other hand, path analysis was employed to test the link between moral foundations and collective action variables.

For the experimental part, the effect of framing ingroup (vs. outgroup) responsibility at the national level on collective action intentions was tested. The path model test explored the interplay between moral foundations, support for system reform and group-based environmental variables (i.e., group-based, and participative efficacy, collective emotions, and movement identification) which proved to be the main determinants of collective action (Bamberg et al., 2015). As a theoretical starting point, the social identity, relative deprivation, and collective efficacy (SIRDE) model of collective action was adopted. The extended SIMCA (van Zomeren et al., 2013) was also embedded, which described the links between group-based variables. The SIRDE model designated social change beliefs and collective

relative deprivation as predictors of activism. In the present model, support for system reform and environmental concern in our model were designated as conceptual parallels to social change beliefs and CRD, respectively.

The path model used in this thesis is derived from three models of collective action and pro-environmental behaviour, i.e., the SIRDE model, SIMCA, and VBN model. Mainly, right hand side of the path model relates to the relationship between collective action variables, which is confirmed by SIMCA model (Van Zomeren et al., 2004). That is, movement identification predicts collective emotions and efficacy beliefs, which then predict collective action intentions (Bamberg et al., 2014). SIRDE model was used to explain the links between support for system reform and group-based variables. Environmental concern, which relates to collective relative deprivation, also included into the present model in line with SIRDE model. Left-hand side of the model relates to individual level predictors of activism, which varied across studies. The central part of the model contains support for system reform. Left and central portion of the path model is inspired by Value-Belief-Norm model, where value orientations and related constructs precede beliefs which then relates to norms, and behavioural intentions. Within this framework, the current path model identifies environmental concern, moral foundations, political ideology, national identification as constructs that are linked to values which are evidenced by past research (Feather, 1994; Hansla et al., 2008; Piurko et al., 2011; Roccas et al., 2010; Thorisdottir et al., 2007; Zapko-Willmes et al., 2021). Although there seems to be no prior evidence explicitly linking psychological distance from climate change and value orientations, there is research connecting perceived distance from climate change to political ideology, which was strongly related to value orientations (Ziegler, 2017). Hence, psychological distance, along with national identification, political ideology, environmental concern, and moral foundations, is conceptualised at the same level of value orientations in the current path model. The central

part of the model utilised support for system reform as the main set of beliefs concerning the environment preceded by value-based constructs, consistent with VBN model. Support for system reform is derived from social change beliefs in SIRDE model (Abrams et al., 2017). A thorough conceptualisation of support for system reforms is given in Section 3.2.2.5. Finally, the present model places support for system reform as the set of beliefs preceding more proximal level, collective action variables, connecting frameworks of VBN model and SIMCA.

Summary of Study Design

The present study examined the effect of perceived ingroup vs. outgroup responsibility concerning environmental wrongdoing on guilt and activism intentions with an experimental approach. The manipulation of perceived responsibility for environmental damage by the ingroup or the outgroup took place at the beginning of the survey. The present study utilised group-based responsibility as an experimental condition rather than a measured variable. Several points may warrant our decision. Firstly, message framing can impact how responsibility of climate change could be attributed to other individuals, certain groups, industry or the government, which results in varying levels of perceived risk and controllability of the problem (Wells et al., 2011). Secondly, attribution of individual responsibility precedes pro-environmental moral norms, hence action intentions and behaviour, i.e., responsibility is antecedent to various environmental variables (VBN: Stern, 2000). Thus, the main aim was to identify the impact of the responsibility framing on pro-environmental attitudes and collective environmental variables within intergroup context. Group-based variables which relates to political orientation and local environmental engagement (i.e., national identification and sense of community, respectively) were also included to examine their role in explaining collective environmental variables.

The experimental condition (i.e., responsibility) was not incorporated into the path model as a predictor variable, therefore it was not a part of the correlational analyses. Instead, MANOVA was used to test the effect of responsibility framing on the model variables. In terms of model development, responsibility was entered as a multi-level variable and multigroup testing assessed invariance across conditions.

The present study tested a path model which incorporated moral foundations as distal predictors of collective action variables, along with environmental concern, and two variables pertaining to different forms of social identity (i.e., sense of community and national identification). Prior studies examined moral foundations or political variables as predictors of environmental engagement (Bliuc et al. (2015). However, the present study is the first to present an environmental activism model incorporating moral foundations to collective action/group-based variables. Based on previous findings: the following hypotheses are presented.

Experimental Hypothesis

H1.1 Ingroup (vs. group) responsibility condition will lead to more group-based guilt, movement identification, and activism intentions.

Exploratory Hypothesis

H1.2 National identity might moderate the effect of responsibility manipulation on guilt and action intentions. That is, ingroup (vs. outgroup) responsibility might lead to higher guilt and action intentions among those with high national identification.

Path Model Hypotheses

H2.1 The link between support for system reform and collective action intentions will be partially mediated by movement identification, emotions, and efficacy. That is, support for system reform will be positively related to movement identification, group-based emotions

(i.e., guilt, anger, and fear), group efficacy, and participative efficacy, which in turn will be positively related to collective action intentions.

H2.2 Harm and justice foundations will be positively related to environmental concern, and support for system reform.

H2.3 Authority and loyalty foundations will be negatively related to environmental concern, and support for system reform, and positively related to national identification.

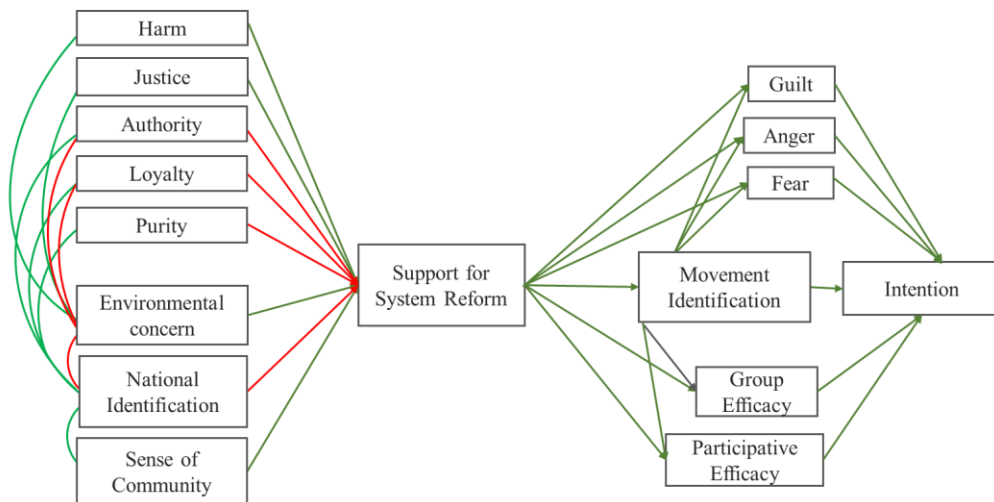
H2.4 National identification will be negatively related to environmental concern and support for system reform, and positively linked to sense of community.

H2.5 Sense of community will be positively related to environmental concern and support for system reform.

H2.6 Environmental concern will be positively related to support for system reform.

Figure 3.1

Hypothesised Path Model



Note. Red lines (vs. green) represent hypothesised negative (vs. positive) relationship.

3.3 Study 1: Method

Participants

UK citizens older than 18 years of age were recruited through Prolific Academic research platform. There were no other specific criteria for the inclusion into the study. Overall, 223 participants took part in the study but 25 of them were excluded from the analysis: 5 did not provide informed consent, 5 failed to complete the study within the given time limit, 14 failed to correctly answer the attention check, and one participant completed the survey in less than 1 minute. Hence, 198 participants (143 female, 55 male, age: $M = 26.51$, $SD = 13.58$) were included in the analysis. The sample size was based on the minimum number recommended for SEM analyses, which is 200 (Boomsma, 2001). Post-hoc sensitivity analyses for main effects and interaction of a 2-level between subjects design showed that the sample size of 198 is enough to detect moderate to large effect size for (Cohen's $f = .200$) for α error probability = .05, power ($1 - \beta$ err prob) = .80. Ad-hoc power analyses was not conducted for experimental part of the study since the recommended number for the model testing was considered as the main determinant of sample size. The minimum recommended number for SEM was chosen due to budget constraints. This limitation applied to Studies 2-4, where no ad-hoc power analyses were run.

Procedure

After providing consent participants were presented with the responsibility manipulation, where they read a short paragraph depicting current environmental problems and attributing responsibility either to the ingroup (i.e., the UK) or the outgroup (i.e., the US). This was followed by a paragraph adapted from Bamberg et al. (2015) describing a local grassroots environmental movement of Transition Towns (TT) movement which is a community-based movement working towards a more sustainable living, a more environmentally friendly and a self-sufficient economy (Haxeltine & Seyfang, 2009).

Participants then filled out a questionnaire, including measures of environmental concern, sense of community (neighbourliness), moral foundations, national identification, support for system reform, group-based emotions (anger, fear, and guilt), group-based and participative efficacy, and collective action intentions. Upon completion participants were debriefed with a short text about the aims of the study.

Materials and Measures

Environmental Responsibility Manipulation

For each condition, participants read a brief paragraph highlighting the high levels of carbon emissions produced by industrial and domestic activities, as well as the environmental damage caused by those. Higher per capita carbon emissions of the United Kingdom (vs. the United States) was focused on to emphasise the ingroup (vs. the outgroup) responsibility for climate change, with sentences such as “Globally, the United Kingdom/United States is among the top 5 countries with the largest carbon footprint per capita, affecting the rest of the world substantially.”

Unless stated otherwise, all constructs were measured on a 5-point Likert scale, where participants stated their level of agreement with the items, where their responses ranged from 1 = strongly disagree to 5 = strongly agree. All the materials and measures are given in Appendix A.

Environmental Concern

Concern for the environment was measured by an 8-item version of New Environmental Paradigm (NEP) scale adapted from Dunlap et al. (2000). NEP scale was developed to examine people's beliefs related to ecological limits, legitimacy of human domination over natural resources, an upcoming ecological catastrophe, and anticipated control over nature (Dunlap et al., 2000). For this study, 2 items having highest loadings on 4 factors were

selected based on factor analysis by Dunlap et al. (2000), hence 8 items out of 15 from the original scale were used. Sample items include “We are approaching the limit of the number of people the earth can support”, “Humans were meant to rule over the rest of nature” (reverse-coded).

Movement Identification

Movement identification was measured with a 6-item scale adapted from Bamberg et al. (2015). Sample items include “I see myself as similar to people who are in the Transition Towns movement”.

Group Efficacy

Efficacy beliefs related to TT movement was measured by two items (Bamberg et al, 2015). Sample items include “Through joint actions, Transition Towns groups could effectively contribute to local climate protection”.

Participative Efficacy

Two items were used to measure beliefs regarding personal efficacy adapted from participative scale in Bamberg et al. (2015). Items are “My active collaboration would be a significant contribution for a local TT group to reach its goals through joint actions”; “With my active collaboration I would make a significant contribution that a TT group could work effectively for local climate protection”.

Behavioural Efficacy

A two-item scale for behavioural efficacy was developed to test whether the participants find the act of attending to TT activities easy: “I think it would be easy for me to take part in local Transition Towns activities” and “I have enough time and resources to work for Transition Towns initiatives if I wanted to”.

Sense of Community

An adapted version of an existing neighbourliness scale was used to measure the sense of community (Wager & Abrams, 2009). The original scale distinguishes five factors of neighbourliness. For the current study only items with the highest loadings in Wager and Abram's (2009) study on three factors were selected. Three items were taken from the interdependence factor, another three items from the entitativity/intragroup similarity factor, and two more items from the ingroup identification factor. Sample items from each factor are: "The fact that I am a member of my neighbourhood/community is an important part of my identity" (ingroup identification), "The members of my neighbourhood/community have similar personalities" (entitativity), and "I depend on other neighbourhood/community members for support" (interdependence).

National Identification

National identification was measured with 4-item scale adapted from Mlicki and Ellemers, (1996) to be used for British citizens. Sample items include: "I identify with British people" and "I am proud to be British".

Moral Foundations

Moral foundations were measured with a short version of moral foundations questionnaire (Graham et al., 2009). The scale consisted of 10 items with two statements for each of the five foundations. Sample items include: "Compassion for those who are suffering is the most crucial virtue" (harm), "Respect for authority is something all children need to learn" (authority), "I would call some acts wrong on the grounds that they are unnatural" (purity), "Justice is the most important requirement for a society" (justice), and "I am proud of my country's history" (loyalty).

Social Change Beliefs

To measure endorsement of the structural change in the power distribution to prevent environmental degradation, a 4-item social change scale was used. This scale was adapted from a social change measure (Abrams & Grant, 2012) to underline issues of environmental degradation. Sample items include “There will need to be a power shift towards local people to enable environmental initiatives such as Transition Towns to succeed.”

Group-based Emotions

A 3-item scale was devised to measure the group-based guilt, anger and fear related to climate change in which each referred to a different emotion. Sample items include "I feel guilty about how we humans are treating the environment." Fear related item was taken from van Zomeren et al. (2010). Anger and guilt related items are adapted from Rees and Klug (2014).

Attention Check

A check was included at the end of the questionnaire and asked participants to recall whether the text at the beginning of the experiment presented Germany, the USA, or the UK as mostly responsible for a greater per capita carbon footprint than other countries. 14 participants failed to recall this information and were therefore excluded from the analyses.

Collective Action Intentions

Activism intentions were measured by 5-item scale. Three items were adapted from Bamberg et al. (2015). Sample items include "I intend to work in local Transition Towns initiative projects".

3.4 Study 1: Results

Descriptive Statistics and Construction of the Aggregated Scores

Reliability analyses showed that Cronbach's alphas were relatively low for moral foundations but otherwise acceptable ($>.60$) for other measures. Descriptive statistics and reliability analysis (Cronbach's alpha) for each scale for both conditions and total sample can be found in Table 3.2.

Since the 5th and 6th items of the efficacy scale were novel items (that is, behavioural efficacy), factor analysis was run to test whether these two items represent a distinct construct from the rest of the scale. Factor analysis on efficacy items yielded a two-factor structure. The first two items (group efficacy) formed the first factor while the last four items (participative, items 3-4, and behavioural efficacy, items 5-6) formed the second factor. This suggested the novel items represent a similar construct to participative efficacy, having slightly higher loadings to the second factor than participative efficacy items. The reliability analysis on the latter four items showed that removing the second item from behavioural efficacy dimension increased the reliability of the scale from .769 to .778. Therefore, participative, and behavioural items were combined into one scale by excluding 6th item (see Table 3.1 for the results of factor analysis). Correlations between all dependent variables are presented in Table 3.3.

Table 3.1

Principal Component Analysis on Efficacy Items

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.887	48.112	48.112	2.887	48.112	48.112	2.407
2	1.196	19.931	68.043	1.196	19.931	68.043	2.172
3	.690	11.501	79.543				
4	.618	10.301	89.844				
5	.335	5.577	95.421				
6	.275	4.579	100				

Pattern Matrix

Items	Component	
	1	2
1	-.055	-.916
2	.069	-.870
3	.697	-.255
4	.642	-.369
5	.750	.015
6	.792	.202

Table 3.2

Comparison of Descriptive Statistics for Each Condition and Total Sample

Dependent Variable	Total Sample			Ingroup		Outgroup		<i>F</i>	<i>p</i>	η_p^2
	<i>M</i>	<i>SD</i>	Cronbach's Alpha	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Harm	4.22	.69	.431	4.05	.72	4.39	.63	12.209	.001	.059
Justice	4.11	.69	.471	3.98	.72	4.23	.65	6.442	.012	.032
Loyalty	3.19	.88	.385	3.17	.90	3.22	.88	.183	.669	.001
Authority	3.44	.92	.420	3.26	.94	3.61	.86	7.570	.006	.037
Purity	3.39	.99	.483	3.35	.98	3.43	1.01	.340	.560	.002
Environmental Concern	3.61	.54	.641	3.60	.54	3.62	.55	.030	.862	<.001
Sense of Community	2.76	.69	.821	2.67	.60	2.84	.77	3.131	.078	.016
National Identification	3.93	.97	.916	3.68	.99	4.16	.89	12.619	<.001	.060
Support for System Reform	3.83	.63	.731	3.73	.63	3.93	.62	5.479	.020	.027
Guilt	3.36	.67	.876	4.00	.70	3.97	.64	.044	.833	<.001
Anger	3.98	.98	-	3.79	.93	3.77	1.03	.013	.909	<.001
Fear	3.78	1.05	-	3.96	1.06	4.07	1.04	.692	.406	.004
Group Efficacy	4.02	.93	-	3.78	.95	3.84	.91	.340	.560	.002
Participative Efficacy	3.81	.69	.810	3.11	.75	3.08	.62	.077	.782	<.001
Movement Identification	3.11	.81	.751	3.36	.75	3.35	.73	.015	.904	<.001
Action Intentions	2.55	.87	.877	2.64	.84	2.47	.90	1.781	.184	.009

Note. Variables that were significantly/marginally different across conditions are indicated in bold.

Table 3.3

Pearson Correlations for Dependent Variables (N = 198)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Harm	-														
2. Justice	.45***	-													
3. Loyalty	.03	.17*	-												
4. Authority	.06	.05	.35***	-											
5. Purity	.25***	.31***	.35***	.42***	-										
6. Environmental Concern	.22**	.13	-.22**	-.17*	-.08	-									
7. Sense of Community	.09	.12	.11	.19**	.29**	-.12	-								
8. National Identification	.06	.12	.51***	.43***	.30**	-.16*	.20**	-							
9. Support for System Reform	.36***	.32***	-.19**	-.04	.14	.48***	.19**	-.02	-						
10. Movement Identification	.05	.03	-.27***	-.15*	-.10	.30***	.18*	-.16*	.41***	-					
11. Guilt	.29***	.25***	-.10	-.03	.17*	.49***	.11	-.05	.63***	.41***	-				
12. Anger	.28***	.16*	-.24**	-.20**	.00	.59***	.02	-.21**	.55***	.28**	.64***	-			
13. Fear	.24**	.17*	-.19**	-.16*	-.05	.57***	.06	-.15*	.59***	.33***	.66***	.55***	-		
14. Group Efficacy	.16*	.07	-.23**	-.05	-.03	.20**	.09	-.10	.48***	.51***	.31***	.19**	.31***	-	
15. Participative Efficacy	.14*	.10	-.09	-.04	.09	.18**	.27***	-.02	.40***	.51***	.33***	.23**	.23**	.44***	-
16. Action Intentions	.14	.49	-.17*	-.08	.60	.18*	.36***	-.10	.32***	.51***	.35***	.27***	.26***	.37***	.59***

Note. * $p < .05$, ** $p < .01$, *** $p < 0.01$ (two-tailed).

Experimental Results

To test H1.1, which predicted that guilt and action intentions would be higher when the ingroup (vs. outgroup) responsibility was highlighted, a multivariate ANOVA was run. Contrary to H1.1, participants in both conditions expressed similar levels of guilt, $F(1, 196) = 0.44$, $p = .83$, $\eta_p^2 = <.001$, and activism intentions $F(1, 196) = 1.781$, $p = .184$, $\eta_p^2 = .009$. In addition, highlighting outgroup (vs. ingroup) responsibility on carbon emissions resulted in higher levels of national identification, support for system reform, harm, justice, and authority foundations. There was no difference in terms of environmental concern and group-based variables across conditions. (See Table 3.1).

Since ingroup and outgroup responsibility conditions differed in terms of national identification, H1.2 could not be tested. Instead, a post-hoc mediation analyses with PROCESS v3.7 was run to see whether the difference in national identification mediates the effect of responsibility manipulation on guilt and action intentions. The results showed that national identification did not mediate the link between condition and intentions. The direct effect, $b = -.129$, $t(196) = -1.01$, $p = .314$, as well as the indirect effect, $b = -.036$, LLCI = $-.1215$, ULCI = $.0246$, were nonsignificant. The relationship between condition and guilt was not also mediated by national identification. Neither the direct effect, $b = -.010$, $t(192) = -.057$, $p = .956$, nor the indirect effect, $b = -.036$, LLCI = $-.1215$, ULCI = $.0246$, was significant.

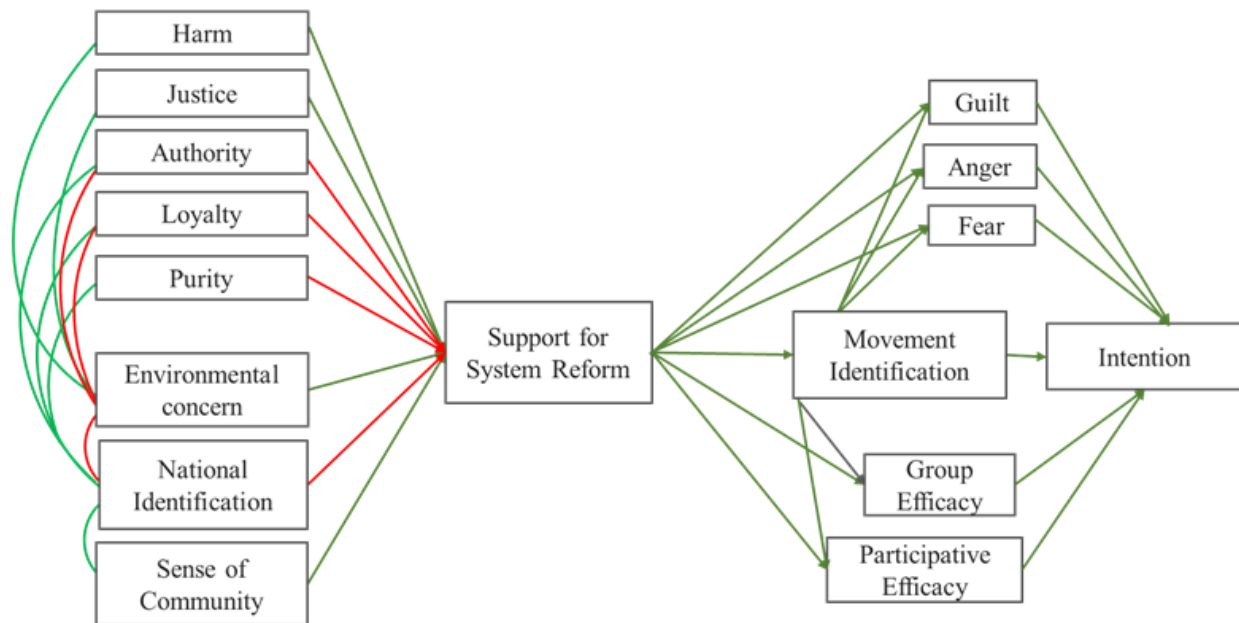
Path Model Test

To test H2.1-6, an extended path model was tested (see Figure 3.3). R (lavaan package) (Rosseel, 2012) was used to assess the fit measures ($n = 198$). The following thresholds have been used to decide whether model fit is good: $CFI \geq 0.95$, $TLI \geq .95$, $SRMR \leq .80$, $RMSEA \leq$

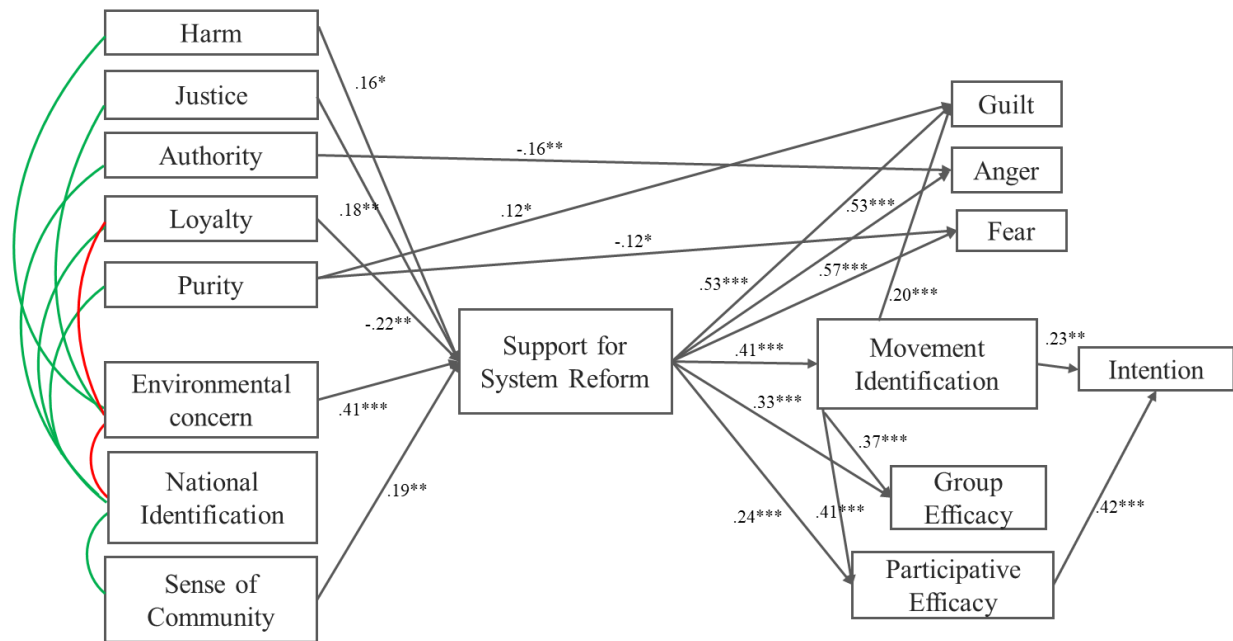
.60 (Hu & Bentler, 1999). SRMR value indicated good fit whereas CFI, TLI and RMSEA did not, $\chi^2 = 168.160$, CFI = .904, TLI = .817, RMSEA = .092, 90% CI [.075, .109], SRMR = .072. Regression paths from purity to guilt, from purity to fear, and from authority to anger were added to the model based on Modification Indices of 14.847, 9.258, and 9.160, respectively. Results revealed that additional paths led to a relatively better fit ; $\chi^2 = 140.314$, CFI = .926; TLI = .853, RMSEA = .082, 90% CI [.061, .097], SRMR = .069).

Figure 3.2

Tested Path Model



Note. Red lines (vs. green) represent negative (vs. positive) relationship.

Figure 3.3*Results of the Path Model Test*

Note. Only statistically significant paths are reported. Green (vs. red) lines represent positive (vs. negative) correlation.

Table 3.4

Tests of Mediation Between Support for System Reform and Actions Intentions

	B	se	t	p	LLCI	ULCI
Total Effect	.444	.094	4.744	<.001	.2595	.6287
Direct Effect	-.116	.115	-1.005	.316	-.3422	.1112
Standardised indirect effects						
Total indirect effect	.404	.064			.2764	.5271
Movement Identification	.094	.038			.0284	.1745
Group Efficacy	.030	.033			-.0334	.0979
Participative Efficacy	.173	.035			.1074	.2457
Guilt	.056	.060			-.0540	.1800
Anger	.040	.051			-.0566	.1434
Fear	.012	.047			-.0849	.1084

Note. Variables that had significant indirect effects are indicated in bold.

A multiple mediation analysis was run to explicitly test H2.1, i.e., whether collective action variables mediated the link between support for system reform and activism intentions. The total effect became nonsignificant once movement identification, participative and group efficacy, and emotions were entered as mediators, indicating full mediation. Among these, participative efficacy and movement identification were significant in terms of indirect effects where participative efficacy was the most influential mediator between support for system reform and activism intentions (See Table 3.4 for coefficients of total direct, indirect, and total effects).

The results of the path model supported H2.2's prediction that individualising foundations of harm and justice would be positively linked to support for system reform and environmental concern. The results partially supported H2.3's prediction that authority and loyalty would be positively related to national identification, and negatively to support for system reform and environmental concern. Loyalty, but not authority, was linked to support for system reform whereas both were linked to environmental concern and national identification as predicted by H2.3.

H2.4's prediction that national identification would be negatively related to environmental concern and support for system reform, and positively linked to sense of community, was partially confirmed. On the path model, national identification was negatively related to environmental concern and positively linked to sense of community. However, support for system reform was not linked to national identification. The results also supported the prediction from H2.5 that sense of community will be positively related to environmental concern and support for system reform, and H2.6 which predicted a positive link between

support for system reform and environmental concern (See Table 3.5 for covariances between variables).

Table 3.5
Covariances Between Moral Foundations and Other Predictors in the Path Model

Dependent Variables	1	2	3	4	5	6	7
1 Environmental Concern							
2 National Identification	-.164*						
3 Sense of Community	-.117	.204**					
4 Loyalty	-.216**	.510***	.107				
5 Harm	.220**	.056	.092	.030			
6 Justice	.131†	.123†	.121†	.174*	.453***		
7 Authority	-.170*	.430***	.192**	.349***	.061	.054	
8 Purity	-.079	.299***	.228**	.352***	.250*	.310***	.418***

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Purity and authority were not linked to support for system reform, but modification indices, which was implemented after the initial path model test, suggested a positive path directly from purity to fear and guilt, and a negative path from authority to anger.

From the path model, support for system reform appeared as a key variable predicting group-based emotions, movement identification, participative, and group-based efficacy. The key role of support for system reform, is in line with the SIRDE model (Grant et al., 2017). None of the group-based emotions was a significant predictor of action intentions.

Multi-Level Testing: Comparison of Nested Models

Upon testing path model for the total sample, invariance of the path model across ingroup and outgroup conditions was assessed. Three degrees of invariance were tested with R software (semTools package). These are configural, scalar, and residual invariance, which refers to

homogeneity of the model configuration, mean values of the parameters, and variance of the parameters across groups, respectively. The results confirmed configural invariance but not scalar invariance. (See Table 3.6 for the comparison between nested models). For acceptance of invariance between nested models, the upper limit for the difference value between fit indices CFI, gamma hat (GH), and McDonald's non-centrality index (NCI) was set to .01, .01 and .02, respectively (L. Milfont & Fischer, 2010). Based on fit indices, configural invariance was confirmed, i.e., the path model configuration was similar across ingroup and outgroup conditions. Scalar invariance was rejected, i.e., the mean scores on observed variables differed between conditions according to fit index comparison and chi-square significance test between models, $\Delta\chi^2$ (df=16) < .001. This was an expected result since the experimental manipulation aimed to create a difference between mean values of the variables across conditions. The scalar invariance testing also confirmed MANOVA results which identified a significant multivariate effect of the condition on the dependent variables.

Table 3.6

Fit Statistics and Comparison of Nested Models

Model	χ^2/df	CFI	GH	NCI	RMSEA	[90% CI]	SRMR	$\Delta\chi^2$	ΔCFI	ΔGH	ΔNCI	Decision
Configural	1.71	.925	.949	.805	.085	.065, .104	.074	-	-	-	-	Accept
Scalar	2.10	.897	.932	.744	.093	.075, .111	.097	50.116	.028	.017	.061	Reject

Notes. CFI = Comparative Fit Index; GH = Gamma Hat; NCI = Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean-square Residual.

3.5 Study 1: Discussion

The present study tested an integrative model of environmental activism among British citizens. Experimentally, it was hypothesised that when encountered with the environmental wrongdoing of their nation (vs. another country), participants would feel more guilty, and hence, they would be more willing to participate in environmental activism. The findings did not provide evidence regarding the effectiveness of ingroup (vs. outgroup) responsibility framing in

motivating action intentions. Interestingly, however, emphasizing ingroup (vs. outgroup) responsibility led to lower levels of harm and justice concerns and lower British identification. In line with the moral disengagement approach, ingroup wrongdoing might have led to distancing from one's ingroup identity as well as the moral foundation of care. Due to heterogeneous distribution of national identification across conditions, moral disengagement hypothesis could not be explicitly tested. Future research might disentangle this twofold pathway to moral disengagement in relation to ingroup wrongdoings. Exploratory mediation analyses revealed that national identification was not a significant mediator of the effect of condition on behavioural intentions and collective guilt. Hence, although national identification levels differed across conditions, it was not significantly linked to key outcome variables.

The experimental results of the study revealed no effect of the responsibility manipulation on activism intentions, i.e., attributing the causes of environmental degradation to ingroup (vs. outgroup) did not result in greater or lower willingness to engage in local climate activism. This lack of main effect could be due to insufficient sample size, hence lower power in detecting small effects. Indeed, simple mean comparisons across conditions hint to this possibility, where differences, although nonsignificant, pointed to the hypothesised direction. Alternatively, the experimental manipulation, which included simply changing the wording across conditions, might not have been powerful enough to induce change in behavioural intentions. Hence, future studies could test whether using visual media depicting harmful impacts of ingroup vs. outgroup actions instead of or in addition to text-based messages could prove more efficient in changing activism intentions.

In terms of correlational hypotheses related to the path model, links from purity and authority to environmental concern and support for system reform were not significant. This

could be due to direct paths added from purity and authority to emotions based on modification indices. Also, based on correlation matrix, purity has an ambivalent characteristic whereas authority is more strongly connected to variables that are linked to social identity (i.e., sense of community and national identification). Hence, justice was the only binding foundation that was consistently linked to environmental outcomes. However, since covariances and regression paths linking moral foundations to other variables are already quite low (around .20), even significant paths should be interpreted with caution.

Support for system reform was not linked to national identification both in the path model and in correlation matrix, contrary to the predictions. National identification had small correlations with most variables except binding foundations, which are more likely to be endorsed by conservatives (Wolsko et al., 2016). The present study used Feygina et al.'s (2010) findings as the basis for using national identification as a proxy of political ideology. However, their study was conducted with the American participants. Hence, the lack of significant effect of national identification on support for system reform in the present study could be partly explained by weaker political polarisation of environmental issues (Ziegler et al., 2017) or a less prominent relationship between national identification and political orientation in the UK compared to the US, which could be tested by future research.

The present study is the first to incorporate moral foundations into environmental activism framework with partial success. Although the model fit statistics did not indicate a good fit, there were notable links between certain variables that confirm the findings of the previous research. Primarily, collective action intentions had the strongest link to participative efficacy, i.e., "belief in making a difference", confirming previous findings on collective action literature (Bamberg et al., 2015; van Zomeren et al., 2013).

Support for system reform, i.e., social change beliefs reformulated within the environmental context, was designated as the central variable in the present model. In line with the expectations, it was positively linked to all collective action variables, as well as being a distal predictor of collective action intentions through efficacy beliefs and movement identification. Hence, based on the path model results, it can be suggested that support for system reform is a key variable connecting environmental concern, which is an individual level attitudinal variable, to collective action variables.

In terms of moral foundations, the path model test showed that those highly endorsing care and justice foundations were more likely to support system reform. Loyalty was the only binding foundation linked to support for system reform and environmental concern, although its effect was small. It was also shown that the effect of moral foundations on environmental emotions are not likely to be explained solely through support for system reform, as indicated by direct paths from foundations to emotions suggested by modification indices.

In addition, the path model test showed that although all group-based emotions were linked to movement identification, none of the emotions significantly predicted collective action intentions. Fear was found to motivate activist attitudes but not actions by previous studies (Groenendyk & Banks, 2014), or even suppress collective protest intentions which were motivated by anger (Miller et al., 2009). Research on climate activism also revealed that fear might be a paralysing emotion unless complemented with efficacy beliefs. Fear could drive concern but may inhibit action, and fear of imminent danger is mostly managed by anger and hope, which also propels action (Kleres & Wettergren, 2017). Guilt, on the other hand, could motivate pro-environmental behaviour (Mallett, 2012). Previous research highlighted anger as the dominant emotion driving collective action (Mackie et al., 2000; Tausch et al., 2011;

Zomeran et al., 2004). Anger also predicted retributive actions towards environmental wrongdoers (Harth et al., 2013). Reparative rather than retributive actions embodied by TT movement (i.e., participation in constructive environmental activities in a local group) could explain why anger was a nonsignificant predictor. Therefore, including retributive political behaviours aiming to punish wrongdoers into intentions measure, such as protesting, could have led anger to be a more prominent predictor of activism intentions.

The present study also demonstrated the role of sense of community as a significant predictor of system reform support, as well as a positive correlate of collective action variables in line with the past findings (Bamberg et al., 2015). Grassroots environmental organisations aim empowering communities by providing means to decentralize environmental decision-making which plays an important role in local adaptation to climate change and promote environmental justice (Jabeen et al., 2010; Schlosberg & Collins, 2014). Hence, these results suggest that emphasising connectedness to one's local community could motivate climate engagement, especially for those otherwise low in environmental concern. Future studies may test the effectiveness of highlighting neighbourhood ties to motivate collective climate action.

Moral Foundations

The positive links between individualising foundations and environmental outcomes in the present study paralleled previous findings documenting greater levels of pro-environmental behaviours (such as using energy efficient bulbs) among those higher on individualising (vs. binding) foundations (Vainio & Mäkinen, 2016). The analyses revealed harm was a stronger predictor of environmental engagement than justice. Indeed, past research also showed that refraining from harm infliction is one of the key motivators of pro-environmental action (Jia et al., 2017). Purity, a binding foundation, was negatively linked to fear but negatively to

environmental guilt. The ambivalent characteristic of purity might be explained by the positive association between purity and conservative political orientation, which is linked to lower environmental engagement in general (Wolsko et al., 2016). Collective guilt, on the other hand, could have been expressed due to perceived violation of the purity/sanctity of natural resources (Taüber et al., 2015). Indeed, highlighting purity violation associated with environmental problems reduced the gap between conservatives and liberals in terms of pro-environmental intentions, primarily by improving attitudes of conservatives (Feinberg & Willer, 2013). Due to its dual characteristic, purity dimension could be utilised in environmental messaging to reduce political polarisation.

Moral foundations had direct links to collective emotions on the path model, highlighting intuitive nature of moral judgments (Graham et al., 2011). Past literature mapped characteristic emotions for each moral domain. For instance, justice violations by others (i.e., cheating) tend to elicit anger, whereas loyalty violations are more likely to result in rage directed at traitors (Canton, 2015). In fact, past research revealed that different moral foundations were dominant predictors of group-based anger among activist groups motivated by either religious, environmental, crime-prevention or social justice-oriented goals, where care and justice were linked to anger for environmental and social justice movements whereas for the others, bindings foundations played a more important role (Milesi & Alberici, 2018). Hence, depending on the objective of the collective action, different foundations might be linked to different emotions. In the context of environmental activism, individualising foundations are more likely to motivate collective emotions and promote action.

The present findings also provided evidence for support for system reform as a strong predictor of collective action variables. However, national identification and authority

foundation, which pertains to affirmation of the hierarchical power structure in society, was not linked to support for system reform contrary to the hypotheses. People who were high on national identification scored higher on authority and purity and they were also lower on environmental concern. This was in line with Feygina et al. (2010)'s findings a negative link between national identification, which is a positive correlate to right-wing political orientation, and environmental concern was observed.

Limitations and Future Directions

There are some limitations associated with the present study. To avoid demand characteristics, perceived responsibility was not measured as a dependent variable. Hence, the findings of the present study could not assess whether the experimental manipulation was effective in increasing ingroup/outgroup responsibility on environmental degradation. In addition, apart from the ingroup responsibility manipulation, a correlational design was used to assess relationships between dependent variables. Thus, although a conceptual ground for the causal sequence of the path model was provided, caution must be taken when inferring causal links from the present results.

All the measures followed the experimental manipulation to avoid demand characteristics. However, it was difficult to ensure whether difference in national identification across conditions was due to experimental manipulation or not. To overcome this limitation, future studies could ensure measurements of stable characteristics or political attitudes taking place prior to the experimental manipulation or ensure having homogeneous distribution of those characteristics across conditions.

In addition, some of the present findings contradicted the theoretical formulation of MFT framework. Moral foundations are partly derived from Schwartz' value structures, which are

defined as temporally stable phenomena (Haidt, 2008; Rokeach, 1975). The present study highlighted that moral foundations may not be as robust as the literature suggests. These findings are promising such that harm or justice foundations are malleable to different message framings. Moreover, since a control group was not used, it is not possible to conclude whether these effects are due to the decrease or increase in moral foundations in respective conditions. Also, reliability issues came up where moral foundation scales had lower than acceptable reliability (.40). Using the full (20-item) scale rather than the short version of moral foundations could have improved reliability. To establish causality, future studies might consider manipulating moral foundations, possibly by highlighting different aspects of environmental issues. Also, the present study presented a responsible entity in the experimental manipulation (i.e., a country) which might have triggered harm considerations. Future studies might present different environmental problems where other concerns (justice, authority etc.) are central to the issue presented.

Conclusion

In sum, the findings of the present study failed to provide consistent evidence on the role of responsibility framing in motivating environmental activism. However, some evidence concerning moral defensiveness concerning ingroup deeds were observed. Although it could not be directly tested, these results suggest social identity (e.g., national identification) could be a potential moderator of the environmental messages. Due to heterogeneous distribution of national identity across conditions, the role of national identification on the effectiveness of responsibility framing could not be tested. Future studies could explore this link with a more appropriate study design. The link between moral foundations and environmental variables were strongest for attitudinal/motivational variables, whereas concrete outcomes, i.e., behavioural intentions, were not linked to moral foundations. Support for system reform, formulated as an

attitude variable, was observed as an essential component of collective action framework. The extended SIRDE collective action framework failed to provide a good fit, although it revealed some significant relationships between constructs. Most importantly, participative efficacy appeared as the strongest proximal predictor of activism intentions, revealing that the belief in one's effectiveness in making a difference is crucial to motivate action. Emotional pathway, however, had a negligible link to activism intentions.

In the present study, intergroup responsibility framing was tested in relation to environmental activism. The following studies will examine how framing proximal (vs. distal) impacts of climate change would influence activism intentions. Specifically, the next two studies used news articles conveying low (vs. high) psychological distance of climate change. Also, a political orientation measure was added to assess the role of ideology in motivating environmental activism more precisely, and national identification was removed from the model. Thus, building on the model developed for Study 1, a framework of environmental action incorporating perceived distance and risk due to climate change is presented in the next studies.

Chapter 4: The Role of Psychological Distance in Climate Activism

4.1 Chapter Overview

Past literature revealed that lowering psychological distance, i.e., presenting climate change impacts as happening here and now, may increase risk perception and motivate climate change engagement (Jones et al., 2017; Maiella et al., 2020). However, this effect was not ubiquitous and demonstrated to be dependent on a host of factors such as people's prior environmental beliefs, political ideology, place attachment, and values system (see Chapter 2 for a more detailed discussion).

The present chapter examines the effect of distance framings of climate change on environmental activism intentions among UK citizens with two experiments (Studies 2 and 3). Both studies focussed on the impact of climate change related news conveying different levels of psychological distance. Study 2 examined the effects of hypothetical and temporal distance framing on activism intentions. It was expected that proximal framing would lead to greater climate change engagement. However, the main effect of temporal distance and uncertainty framings on any of the environmental outcomes, i.e., collective action variables, environmental concern, and support for system reform was nonsignificant. It was found that distance manipulations were effective in changing both (temporal and hypothetical) perceived distances. Higher uncertainty framing led to greater uncertainty on the scope, but not the seriousness of climate change impacts. Temporally distant (vs. near) framing resulted in greater perceived temporal distance as well as uncertainty concerning scope of impacts. The interaction analyses revealed that those with right-wing political ideology were not impacted by proximal (vs. distal) temporal framing whereas those with left-wing political views had higher activism intentions.

Study 3 assessed the effect of spatial distance framing on activism intentions and risk perceptions both at the local and global levels. It was expected that spatially close framing would result in greater risk perceptions and activism intentions. The proximal framing resulted in lower perceived spatial, lower social distance of climate change and higher local risk perceptions, but not global risk perceptions and activism intentions. The interaction between distance manipulation and political ideology was significant for some but not all dependent variables. That is, proximate (vs. distal) framing resulted in lower efficacy beliefs and activism intentions for those with right-wing political ideology.

Studies 2 and 3 also utilised an extended path model derived from the Social Identity, Relative Deprivation and Collective Efficacy (SIRDE) framework of collective action, as in Study 1. However, the path model was modified to include dimensions of psychological distance as distal predictors of activism intentions. The right-hand side of the path model, i.e., collective action variables, was the same as Study 1. Model test yielded a satisfactory fit where participative efficacy appeared as the strongest predictor of activism intentions for both studies.

4.2 Study 2

Past literature suggests that framing temporal and hypothetical distance of climate change impacts could improve climate change mitigation support and pro-environmental engagement. However, it is established that these impacts may be moderated by various factors (See Chapter 2.5 for a detailed discussion). The present study compared the effectiveness of proximal and distal framings of temporal and hypothetical distance (i.e., uncertainty) of climate change impacts on activism intentions among British citizens and examined the role of political ideology and environmental concern as moderators of framing impact.

The present study aims to contribute to the literature in several ways. First, past studies on climate change perception did not focus on manipulating uncertainty and temporal dimensions of psychological distance from climate change simultaneously. Hence, the present study aims to fill this gap by exploring the interplay of these two dimensions. Secondly, the role of psychological distance on policy support and private sphere (personal) pro-environmental behaviours was examined, whereas collective environmental action was not given much attention. Thus, the present study is the first to test temporal and uncertainty framings of climate change together and explore the interplay between these distances on group-based variables and environmental activism intentions.

The present study also explored the effects of political ideology and environmental concern as potential moderators of distance framings. Prior research showed backfiring effect in response to proximal framing of climate change impacts among conservatives (Feinberg & Willer, 2011; Rickard et al., 2016) although some studies could not replicate this effect (Yang et al., 2020). Hence, it was tentatively expected that people towards the right-hand side of the political spectrum or those not highly concerned about the environmental issues would be less motivated to participate in activism in response to proximate (vs. distal) temporal and hypothetical distance framing, whereas those with left-wing political orientation or those highly concerned about environment will be less affected by distance framings.

In terms of the path model, the SIRDE framework from the previous study was adopted with some modifications (see Study 1, Chapter 3). Firstly, a one-item measure of political orientation was used unlike relying on national identification as a proxy political ideology measure as in Study 1. Secondly, moral foundations were omitted from the current study and path model, primarily due to nonsignificant or weak relationships between moral foundations

and environmental outcomes, i.e., environmental collective action variables and support for system reform in Study 1. Also, path model was modified to examine the effect of psychological distance on collective climate action. Hence, perceived uncertainty and temporal distance from climate change, alongside environmental concern, and political ideology, were designated as antecedents to support for system reform and collective action variables.

Experimental Hypotheses

H1.1 Distal (vs. proximal) temporal distance condition will result in lower movement identification, collective emotions, and activism intentions, i.e., collective action variables.

H1.2 High (vs. low) uncertainty condition will result in lower movement identification, emotions, and collective action intentions.

Exploratory Analyses

In addition to these first hypotheses, the interaction between political ideology and environmental concern and distance framings was explored. Given the inconsistent findings in the literature, we consider them more openly in an exploratory manner.

H1.3a Those with a more right-wing political ideology would report lower engagement on collective action variables for proximal (vs. distal) temporal distance framing or high (vs. low) uncertainty.

H1.3b Those with low environmental concern would score lower on collective action variables proximal (vs. distal) temporal distance framing or low (vs. high) uncertainty.

Path Model Hypotheses

H2.1 Perceived uncertainty and temporal distance of climate change will be negatively linked to support for system reform.

H2.2 The relationship between support for system reform and activism intentions will be mediated by collective emotions, movement identification, and efficacy beliefs.

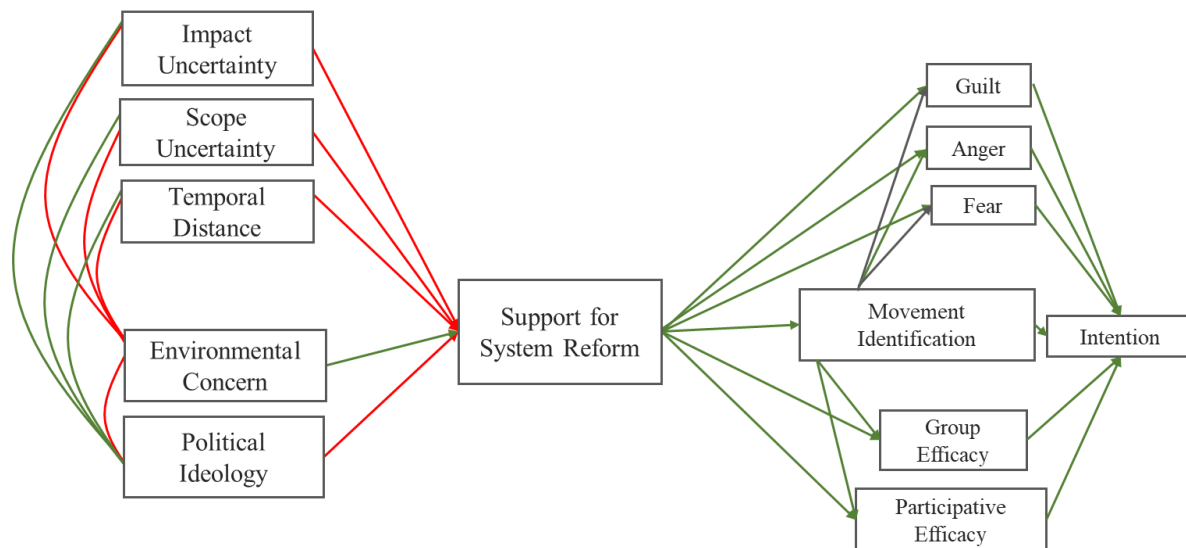
H2.3 Perceived uncertainty and temporal distance of climate change will be negatively related to environmental concern.

H2.4 Perceived uncertainty and temporal distance of climate change will be positively related to right-wing political orientation.

H2.5 Environmental concern will be positively, and political ideology will be negatively linked to support for system reform (See Figure 4.1 for the proposed path model).

Figure 4.1

Hypothesised Path Model



Note. Red (vs. green) lines indicate negative (vs. positive) correlation.

4.3 Study 2: Method

Participants

For the present study, British citizens older than 18 years of age were recruited via Prolific Academic research platform. In total, 228 participants took part in the experiment. Upon completion of the study, two multiple-choice attention checks assessed comprehension of the news articles, where participants were asked to repeat the correct time frame (2030 and 2120) and certainty (high and low) of climate change impacts presented in the articles. Participants who failed to answer correctly both attention checks ($N=24$) were excluded from the analysis. The final sample consisted of 204 participants (118 females, 86 males, *Mean age* = 34.76, *SD* = 12.50). The sample size was determined based on the recommended rule-of-thumb minimum sample size for SEM, $N = 200$ (Boomsma, 2001). For the experimental part of the study, G*Power (Faul et al., 2007) was also used to run a sensitivity power analyses for 2 by 2 experimental design. Results showed that our sample size would allow to detect moderate to large effect size for main effects and for interaction (Cohen's $f = .199$) for α error probability = .05, power ($1-\beta$ err prob) = .80.

Study Design and Procedure

A 2 temporal distance (high vs. low) x 2 uncertainty (high vs. low) between-subjects experimental design was utilized for the present study. After online recruitment, participants gave informed consent. Upon providing consent, one of the four news articles introducing the distances manipulation was randomly presented to each participant. After reading, participants filled the different scales measuring the mediators and dependent variables. Two attention checks were added at the end of the experiment to assess the comprehension of the time frame and

uncertainty conveyed by news articles. Upon completion of the study participants were thanked and debriefed.

Materials

News Articles

Four ostensible news articles from Reuters website were created for the current study. The news texts and visuals were adapted from various news outlets reporting on climate change impacts (e.g., BBC news and the Guardian). For each condition, climate change impacts were portrayed within the time frame of either 12 years (2030) or 102 years (2120) from the present (2019) and emphasizing either high or low level of scientific consensus on the scope of the impacts. Uncertainty manipulation was introduced with sentences such as “Climate scientists haven’t reached a total agreement on the extent of the risk posed by climate change” (high uncertainty) or “Climate scientists mostly agree on the extent of the risk posed by climate change” (low uncertainty). For temporal distance manipulation, the year of impacts in the title and within the text was changed across conditions. For example, participants read “Without further action heat-related deaths may triple to 7,000 in 60 in 2030 (vs. 2120)” in proximal (vs. distal) framing condition.

Measures

As in Study 1, dependent variables included support for system reform, group and participative efficacy, action intentions and group-based emotions. Activism intentions measure included two additional items: “I would be willing to sign a petition to push the governments worldwide to legislate for policies that slow or stop climate change.” and “I intend to join a protest to demand that politicians should take necessary actions to lower carbon emissions and

prevent more environmental degradation worldwide.” Additional measures were perceived temporal distance and uncertainty of climate change, and political ideology.

Temporal Distance of Climate Change

Perceived temporal distance of climate change impacts was measured with one item (Poortinga et al., 2011). On a slider scale of years ranging from 2020 to 2120, participants indicated the year they thought we will experience the most serious impacts of the climate change. Higher values hence indicated greater temporal distance.

Hypothetical Distance (Uncertainty) of Climate Change

A two-item scale was adapted from Poortinga et al. (2011) to measure perceived uncertainty of climate change. Items were: “I am confident that climate change will pose a serious threat to the natural life in the future” and “It is uncertain what the effects of climate change will be”. Responses ranged from 1 = *completely disagree* to 5 = *completely agree*. Those two items exhibited different patterns of relationships to other dependent variables, and to the experimental manipulation. In addition, conceptually they pertain to different facets of uncertainty, warranting for separate analysis of two items. Thus, we labelled the first item as “impact uncertainty”, i.e., uncertainty related to the seriousness of climate change impacts, and the second as “scope uncertainty”, i.e., uncertainty concerning the range and specificity of impacts.

Political Ideology

One item was used to assess political orientation where participants indicated where they place themselves on a scale ranging from 1 = extremely left to 7 = extremely right.

4.4 Study 2: Results

Descriptive statistics and reliability statistics can be found in Table 4.1. Cronbach's alpha values were around .7 or higher for each composite variable.

Table 4.1

Descriptive Statistics and Reliability Coefficients

	M	SD	Cronbach's alpha
Temporal Distance (year)	2057.28	30.39	-
Impact Uncertainty	1.52	.84	-
Scope Uncertainty	3.17	1.25	-
Political Ideology	3.23	1.35	-
Environmental Concern	3.78	.57	.67
Support for System Reform	3.97	.70	.77
Movement Identification	3.66	.73	.88
Anger	4.05	1.00	-
Guilt	4.01	.99	-
Fear	4.15	.90	-
Participative Efficacy	3.31	.81	.77
Group Efficacy	4.01	.76	.86*
Activism Intentions	3.03	.84	.85

Note. * Spearman-Brown coefficient.

Pearson correlations between dependent variables and manipulation checks (perceived distances) are presented in Table 4.2. Impact uncertainty had a moderate to strong negative relationship with group-based and pro-environmental variables and a positive relationship to right-wing political orientation, whereas scope uncertainty had negligible correlations with most variables. There were no outliers for perceived temporal distance measure.

Table 4.2

Correlations for Dependent Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Temporal Distance (year)	-											
2. Impact Uncertainty	.26**	-										
3. Scope Uncertainty	.03	.25***	-									
4. Political Ideology	.17*	.30***	.10	-*								
5. Environmental Concern	-.22**	-.51***	-.16*	-.36***	-							
6. Support for System Reform	-.21**	-.55***	-.15*	-.22**	.49***	-						
7. Movement Identification	-.15*	-.48***	-.11	-.30**	.51***	.60***	-					
8. Anger	-.10	-.45***	-.06	-.24***	.41***	.53***	.54***	-				
9. Guilt	-.18**	-.44***	-.07	-.26***	.51***	.57***	.61***	.65***	-			
10. Fear	-.18**	-.69***	-.17*	-.29***	.49***	.62***	.56***	.52***	.58***	-		
11. Participative Efficacy	-.13	-.30***	-.01	.00	.24**	.44***	.56***	.38***	.35***	.35***	-	
12. Group Efficacy	-.21**	-.53***	-.13	-.17*	.35***	.62***	.60***	.45***	.44***	.55***	.54***	-
13. Activism Intentions	-.18*	-.39***	-.14	-.20**	.35***	.51***	.69***	.48***	.52***	.51***	.66***	.54***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ (2-tailed).

Tests of Manipulation Checks

Before testing specific hypotheses, potential allocation bias across experimental conditions was assessed. In terms of political orientation, no difference was observed across low temporal ($N = 99$, $M = 3.23$, $SD = 1.26$) and high temporal ($N = 105$, $M = 3.23$, $SD = 1.44$) distance conditions ($t(202) = .020$, $p = .984$). However, compared to the high uncertainty condition ($N = 105$, $M = 3.00$, $SD = 1.32$), participants in the low uncertainty condition ($N = 99$, $M = 3.47$, $SD = 1.35$) were more right-wing oriented politically, $t(202) = -2.54$, $p = .012$. Hence political ideology was treated as a control variable when testing for main effects of conditions on dependent variables.

MANOVA with uncertainty and temporal distance as independent variables, and perceived distances as dependent variables revealed a significant multivariate main effect for temporal distance condition, $F(3, 197) = 3.016$, $\eta^2 = .044$, $p = .031$, and for uncertainty condition, $F(3, 197) = 4.259$, $\eta^2 = .061$, $p = .006$. The interaction between uncertainty and temporal distance conditions was not significant, $F(3, 197) = .797$, $\eta^2 = .012$, $p = .407$ (see Table 4.3 for MANOVA results for all variables). Uncertainty and temporal distance framings had a significant effect on both manipulation checks, i.e., perceived uncertainty and temporal distance. Participants in the distant (vs. near) time framing reported higher scope uncertainty ($\eta^2 = .023$) and greater perceived temporal distance ($\eta^2 = .021$), whereas impact uncertainty was the same across all four conditions. Those presented with high (vs. low) scientific uncertainty concerning the scope of impacts had higher scope uncertainty ($\eta^2 = .019$) and lower perceived temporal distance ($\eta^2 = .040$), but not impact uncertainty.

Hence, the distance manipulations were effective in changing not only perceptions of the corresponding distance but of the other distances as well, supporting an interdependence and

covariation of distance dimensions, as frequently observed in the literature. It is also interesting to note that uncertainty manipulation had a stronger effect ($\eta^2 = .040$) on perceived temporal distance than on perceived scope uncertainty ($\eta^2 = .019$) indicating a strong interdependence of distances and conceptual intersections.

In sum, scope uncertainty, but not impact uncertainty, was higher in high (vs. low) uncertainty condition and high (vs. low) temporal distance condition. This was an expected result considering the content of news articles, which conveyed uncertainty about the scope of the climate change impacts, but not uncertainty about the existence or seriousness of climate change. The interaction between two conditions on manipulation checks, however, was not significant.

Experimental Findings: Main Effects

Path Model Hypotheses

A second MANOVA was used to test the effect of temporal distance and uncertainty manipulations as independent variables on group-based outcomes, environmental concern, and support for system reform as dependent variables, while controlling for political ideology. Multivariate main effect for temporal distance condition, $F(9, 191) = 1.117$, $\eta p^2 = .050$, $p = .353$, for uncertainty condition, $F(9, 191) = .948$, $\eta p^2 = .043$, $p = .484$, and for the interaction between uncertainty and temporal distance was not significant, conditions, $F(9, 191) = .805$, $\eta p^2 = .037$, $p = .612$ were not significant. The findings did not provide support for H1.1's and H1.2's predictions that low temporal and hypothetical distance would result in greater climate change engagement. That is, uncertainty and temporal distance manipulations did not have a significant effect on any of the dependent variables (See Table 4.3).

Table 4.3

The Effect of Distance Framings on Dependent Variables and Perceived Distance

Dependent Variable	Uncertainty							Temporal Distance					Interaction				
	Low	SD	High	SD	F	p	η^2	Low	SD	High	SD	F	p	η^2	F	p	η^2
<i>Manipulation Checks (Perceived Distances)</i>																	
Temporal Distance	2063.35	2.98	2051.24	2.89	8.377	.004	.040	2053.07	2.95	2061.53	2.87	4.221	.041	.021	.213	.645	.001
Impact Uncertainty	1.56	.08	1.49	.08	.431	.512	.002	1.50	.08	1.54	.08	.110	.741	.001	1.390	.240	.007
Scope Uncertainty	2.99	.12	3.33	.12	3.907	.049	.019	2.97	.12	3.35	.12	4.704	.031	.023	.450	.503	.002
<i>Dependent variables</i>																	
Environmental Concern	3.75	.05	3.81	.05	.726	.395	.004	3.80	.05	3.75	.05	.404	.526	.002	.250	.618	.001
System Reform	3.95	.07	3.99	.07	.114	.736	.001	4.02	.07	3.92	.07	1.054	.306	.005	.210	.647	.001
Movement Identification	3.64	.07	3.67	.07	.098	.755	<.001	3.64	.07	3.67	.07	.064	.801	<.001	.003	.958	<.001
Anger	3.98	.10	4.11	.10	.852	.357	.004	3.96	.10	4.13	.10	1.589	.209	.008	.988	.321	.005
Guilt	4.08	.10	3.95	.10	.902	.343	.005	3.97	.10	4.06	.09	.426	.515	.002	.765	.383	.004
Fear	4.10	.09	4.20	.09	.673	.413	.003	4.19	.09	4.10	.09	.572	.450	.003	.026	.871	<.001
Part. Efficacy	3.24	.08	3.38	.08	1.456	.229	.007	3.34	.08	3.27	.08	.458	.499	.002	.417	.519	.002
Group Efficacy	3.98	.08	4.05	.07	.487	.486	.002	4.05	.08	3.98	.07	.369	.544	.002	.105	.746	.001
Activism Intentions	2.99	.08	3.07	.08	.544	.461	.003	3.09	.08	2.97	.08	1.126	.290	.006	.382	.537	.002

Note. Political ideology is a control variable.

Exploratory Analyses: Moderation Tests

To explore H1.3a and H1.3b, which proposed an interaction between conditions and political ideology and environmental concern on collective action variables, three moderation analyses were conducted using PROCESS (version 3.7). For uncertainty manipulation, moderation analysis for political ideology was not performed due to heterogeneous distribution of political ideology for low and high uncertainty conditions.

The most distal and proximal collective action variables, i.e., action intentions and movement identification, were treated as the outcomes of the moderation analyses. For activism intentions, the analysis revealed a significant temporal distance by political ideology interaction ($p = .004$). Specifically, left-wing participants had higher action intentions in the proximal than distal condition, whereas right-wing participants were not affected by temporal distance framing (See Table 4.5).

For movement identification, the analysis revealed a marginal interaction of uncertainty condition by environmental concern ($p = .075$). Further examination of this interaction suggested a trend where those low in environmental concern exhibited less movement identification for low uncertainty condition although this was not statistically significant. No other interaction effect was significant. See Table 4.4 and 4.5 for the summary of the moderation analyses and conditional effects of moderator variables.

Table 4.4

Interaction of Conditions by Political Ideology or Concern on Movement Identification

Condition (IV)	Moderator	B	SE	F	t	p	LLCI	ULCI
Temporal Distance	Ideology	.077	.074	1.108	1.053	.294	-.0685	.2222
Temporal Distance	Concern	-.096	.155	.382	-.618	.537	-.4004	.2093
Uncertainty	Concern	-.284	.159	3.203	-1.790	.075	.5972	-.0289

Note. df (1,200) for temporal distance, (1,199) for uncertainty.

Table 4.5

Interaction of Conditions by Political Ideology or Concern on Activism Intentions

Condition (IV)	Moderator	B	SE	F	t	p	LLCI	ULCI
Temporal Distance	Ideology	.248	.085	8.467	2.9010	.004	.0800	.4166
Temporal Distance	Concern	-.014	.196	.005	-.071	.943	-.4012	.3732
Uncertainty	Concern	-.156	.203	.596	-.772	.441	-.5562	.2532

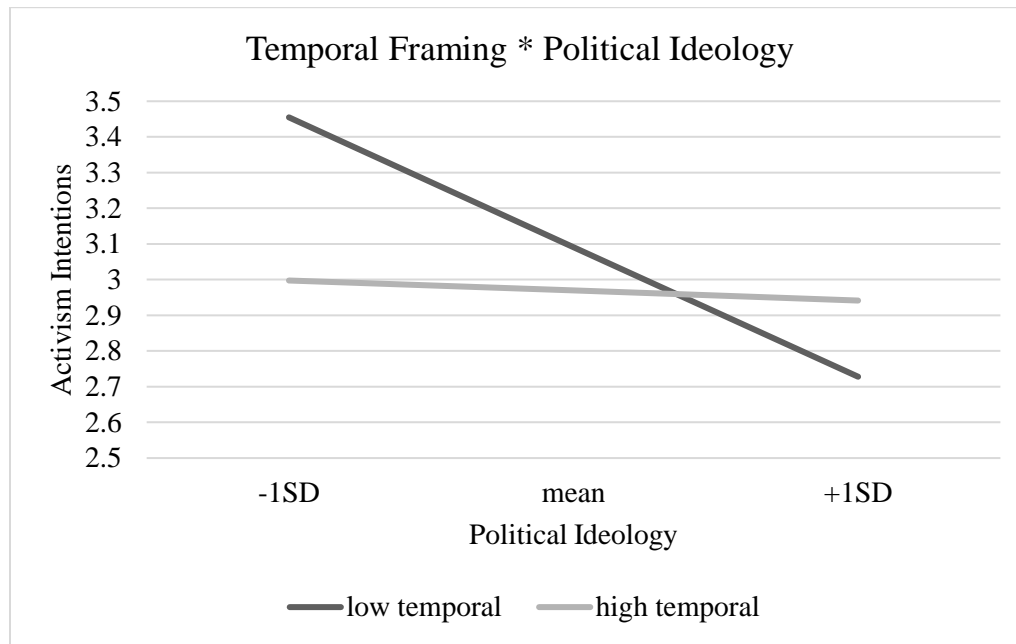
Note. df (1,200) for temporal distance, (1,199) for uncertainty. Variables in bold represent statistically significant effects.

Conditional Effects of Temporal Distance Manipulation on Activism Intentions

Political Ideology	B	SE	t	p	LLCI	ULCI
1.88 (left)	-.457	.162	-2.826	.005	-.7762	-.1382
3.23 (mid)	-.122	.114	-1.074	.284	-.3458	.1019
4.58 (right)	.213	.162	1.319	.189	-.1056	.5323

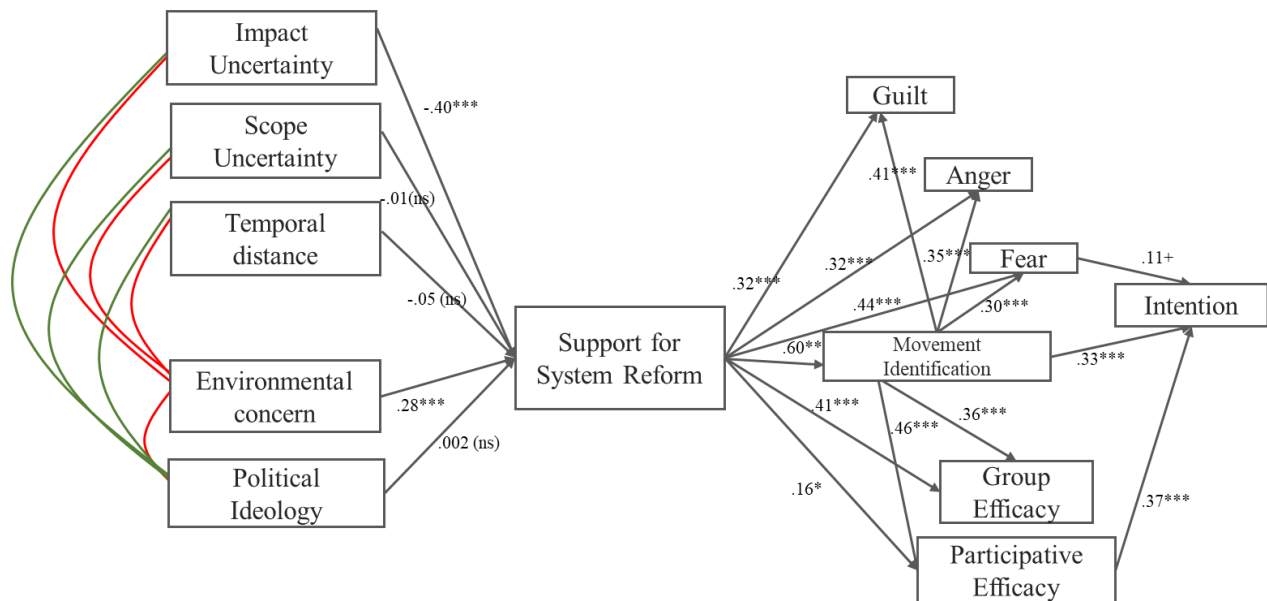
Figure 4.2

Interaction Between Political Ideology and Temporal Framing on Activism Intentions



Path Model Test

Since temporal distance and uncertainty framings were effective in manipulating distances, but not other dependent variables, perceived temporal distance, impact and scope uncertainty, political ideology and environmental concern were designated as predictor variables in the path model. The path model in Study 1 was used as a priori starting point to develop the current model. Figure 4.1 and Figure 4.3 present the hypothesised path model and model test results (i.e., standardised regression coefficients) respectively. The following thresholds have been used to decide whether model fit is good: $CFI \geq 0.95$, $TLI \geq .95$, $SRMR \leq .80$, $RMSEA \leq .60$ (Hu and Bentler, 1999). SRMR value indicated good fit whereas CFI, TLI and RMSEA did not, χ^2 ($df = 42$) = 143.180, $CFI = .914$, $TLI = .840$, $RMSEA = .109$ [90 % CI = .89, .128], $SRMR = .078$.

Figure 4.3*Path Model Results*

Note. $*** p < .001$, $** p < .01$, $* p < .05$, $+ p < .10$.

H2.1's prediction that perceived uncertainty and temporal distance of climate change would be negatively linked to support for system reform, was partially supported by the path model results. Impact uncertainty, but not scope uncertainty and temporal distance, negatively predicted support for system reform. To test H2.2's prediction that the link between support for system reform and action intentions would be mediated by group-based variables, a multiple mediation analysis was performed with Model 4 in PROCESS (v3.7). Participative efficacy and movement identification fully mediated the link between support for system reform on activism intentions, hence supporting H2.2 (See Table 4.6 for total, indirect and direct effects).

Path model results supported H2.3, which proposed a negative link between environmental concern and perceived distances. H2.4's prediction that perceived distances would be positively associated with political orientation, was also confirmed. Finally, results also

partially supported H2.5 where environmental concern was positively related to support for system reform, whereas the link between right-wing political ideology and support for system reform was not significant (See Fig. 4.3). Fear but not anger and guilt, positively predicted action intentions although the effect was marginal. Also, although strongly related to movement identification and support for system reform, group efficacy did not predict action intentions whereas participative efficacy did.

Table 4.6

Tests of Mediation Between Support for System Reform and Actions Intentions

	B	SE	t	p	LLCI	ULCI
Total Effect	.608	.073	8.364	<.001	.4644	.7509
Direct Effect	-.034	.080	-.415	.678	-.1914	.1248

Standardised indirect effects	B	SE	LLCI	ULCI
Total	.641	.070	.4988	.7737
Movement Identification	.241	.053	.1410	.3481
Anger	.014	.043	-.0790	.0920
Guilt	.075	.050	-.0220	.1762
Fear	.086	.049	-.0124	.1831
Group Efficacy	.028	.047	-.0660	.1195
Participative Efficacy	.198	.042	.1204	.2855

To test the invariance of the path model across conditions, fit indices were compared across nested models, where uncertainty and temporal distance conditions were treated as the multilevel variable. The threshold of difference for accepting invariance was set at .01, .01, and .02 for CFI, GH and NCI, respectively and .05 of significance level of chi-square ANOVA test between models (L. Milfont & Fischer, 2010). That is, model invariance across nested models was decided when differences between fit indices were lower than these threshold values. Across distal and proximal temporal manipulation, configural invariance was accepted based on fit index differences. As the next step, scalar invariance was tested to assess whether means of

observed variables differed across conditions. The fit statistics comparison also supported scalar invariance. Finally, residual invariance, i.e., equality of variances for observed variables, was assessed. This was also supported by the comparison of fit statistics.

For uncertainty manipulation, configural invariance, i.e., invariance of the path model across conditions, was not supported according to fit index comparisons. Hence, partial invariance was sought as the next step on invariance testing (Milfont & Fisher, 2010). Firstly, regression coefficients were constrained to be equal across high and low uncertainty conditions. Then, to select paths which would be allowed to vary, low and high uncertainty conditions were compared by calculating the difference of standardised regression coefficients in the path model. Starting from the path showing greatest difference of standardised regression coefficients across conditions, each path was added in succession to the list of paths that were not constrained to be equal. Fit statistics for the partial invariance model was computed at each step until a satisfactory fit index was achieved (i.e., CFI > .90). After setting four paths to be unconstrained across conditions, partial invariance was achieved. The next level of invariance testing, i.e., scalar invariance, was rejected based on fit index comparisons and chi-square ANOVA test across nested models (see Table 4.7).

Partial invariance test across uncertainty conditions revealed that the model configuration was highly similar for both conditions except the selected four paths that were not constrained to be the equal across conditions (see Table 4.7 note for the description of these four paths). Political ideology appeared either as a predictor or as a covariate for three out of these four unconstrained regression paths. This was not surprising because political ideology scores differed significantly across low and high uncertainty conditions. In sum, testing of the nested

path models showed partial configural invariance across uncertainty conditions and full configural invariance and scalar invariance across temporal distance conditions.

Table 4.7
Invariance Tests

Fit Statistics of Nested Models: Comparison Across Uncertainty Conditions

Model	χ^2	df	χ^2/df	CFI	GH	NCI	RMSEA	[90% CI]	SRMR	Comparison	$\Delta\chi^2$	ΔCFI	ΔGH	ΔNCI	Decision	$\Delta\chi^2$ sig.
Configural (Baseline)	210.726	84	2.509	.893	.913		.122	.101, .142	.083	-	-	-	-	-	Reject	-
Partial Configural	221.01	105	2.105	.902	.920	.751	.104	.085, .123	.096	Model 2 vs. 1	10.284	.009	.007	.020	Accept	.975
Scalar	256.293	118	2.172	.883	.906	.711	.107	.089, .125	.108	Model 3 vs. 1	35.283	-.019	-.014	-.040	Reject	<.001

Notes. CFI = Comparative Fit Index; GH = Gamma Hat; NCI = Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardised Root Mean Residual. Metric invariance analysis was omitted, as there were no latent variables in the model and only observed variables were used. For partial invariance test. The following were allowed to vary across conditions: covariances between political ideology and environmental concern, political ideology and scope uncertainty, fear and anger, and the regression path from political ideology to support for system reform.

Fit Statistics of Nested Models: Comparison Across Temporal Distance Conditions

Model	χ^2	df	χ^2/df	CFI	GH	NCI	RMSEA	[90% CI]	SRMR	Comparison	$\Delta\chi^2$	ΔCFI	ΔGH	ΔNCI	Decision	$\Delta\chi^2$ sig.
Configural (Baseline)	202.225	84	2.407	.903	.918	.747	.117	.097, .138	0.085	-	-	-	-	-	Accept	-
Scalar	221.054	97	2.279	.899	.914	.737	.112	.092, .132	0.092	Model 2 vs. 1	18.829	-.004	-.004	-.011	Accept	.128
Residual	240.664	110	2.188	.893	.910	.725	.108	.089, .126	0.112	Model 3 vs. 1	19.61	-.006	-.004	-.012	Accept	.105

Notes. CFI = Comparative Fit Index; GH = Gamma Hat; NCI = Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardised Root Mean Residual. Metric invariance analysis was omitted, as there were no latent variables in the model and only observed variables were used

Table 4.8
Covariances on the Path Model

	1	2	3	4
1 Political Ideology	-			
2 Environmental Concern	-.36**	-		
3 Impact Uncertainty	.30***	-.51***	-	
4 Scope Uncertainty	.01	-.16*	.25***	-
5 Temporal Distance	.17**	-.22**	.26***	.03

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed).

4.5 Study 2 Discussion

The present study tested the impact of framings of climate change impacts on willingness to engage in collective climate action among British citizens. Specifically, news articles conveying different levels of temporal distance and uncertainty of climate change impacts were compared in terms of effectiveness in motivating environmental activism intentions.

Firstly, although distance framings were successful in changing respective distances towards the intended direction, no main effects on collective action variables were found which were not expected in the first place. However, it is shown that political ideology moderated the link between temporal distance and activism intentions but not movement identification. Specifically, for those with left-wing political ideology, temporal alarmism, i.e., presenting impacts that are closer (vs. distant) in time, resulted in greater activism intentions, whereas for those with stronger right-wing political orientation, proximate framing was not effective in changing intentions. These findings did not show a negative effect of proximal framing (i.e., boomerang effects) among conservatives, although indicating differential effect of framing along political spectrum. The effect was significant for activism intentions but not for movement identification. Hence, it could be suggested that the political polarisation is more likely to occur

for behavioural intentions than attitudinal variables, arguably due to more specific and concrete nature of behavioural intentions (Liu et al., 2020).

For left-wing participants closer temporal framing led to higher activism intentions. Some of the previous studies indicated that for left-wing participants climate change related beliefs are more stable to distance manipulations (Rickard et al., 2016) whereas some others found liberals' environmental intentions increase with the lower distance (Yang et al., 2020). The present results are in line with Yang et al.'s (2020) findings. This could be due to sampling differences. Rickard et al. (2016) used American participants whereas Yang et al. (2020) recruited Singaporean participants. Research suggested there is a stronger polarisation of climate change issues in the USA compared to other countries (Smith & Mayer, 2019). Since British participants took part in the present study, the political polarisation was weaker than the American participants, which could have led to a positive effect of framing of distance manipulation on left-wing participants. Hence, climate change related opinions of liberals could be more robust in the US than in other countries, due to the lesser political significance or the weaker polarisation of the issue.

Research showed that boomerang effects are more strongly observed in the extreme right-wing population (Zhou, 2016). The lack of consistent boomerang effects among conservatives for environmental outcomes in the present study might be attributed to a positively skewed distribution of political views in our sample, i.e., a higher ratio of left-wing or moderate to right-wing participants taking part in the study, hence the absence of extreme right-wing participants. In addition, most studies documenting boomerang effects in climate change communication included samples from the US, where polarisation on climate change is more amplified than in Britain (Smith & Mayer, 2019; see also Chapter 6 for a more detailed discussion).

The interaction between uncertainty and political ideology could not be tested since political ideology differed across low and high uncertainty conditions. Hence, it was not possible to deduce whether uncertainty framing led to political polarisation on movement identification or activism intentions. Future studies could ensure homogeneous distribution of political ideology across experimental conditions prior to the experiment to overcome this problem.

Scope vs. Impact Uncertainty

It is worth to note that impact, but not scope uncertainty was also strongly related to all environmental variables, and predominantly collective fear of environmental degradation. This is perfectly in line with the previous findings where there is an established link between uncertainty regarding seriousness of climate change impacts and lower support for green policies, willingness to sacrifice, and environmental concern (Jones et al., 2017). It should be noted that mean impact uncertainty was quite low (around 1.5 on a 1 to 5 Likert scale) in the present study. In line with the past literature, which indicated climate change denialism is much less common than uncertainty concerning its impacts. Still, the findings of Study 2 provided evidence related to the independence of two components of uncertainty of climate change, i.e., impact uncertainty and scope uncertainty which suggest that not all forms of uncertainty were equally linked to lower climate change engagement. For the policy makers and campaigners, this could have some implications. That is, public uncertainty or lack of knowledge concerning the scope of impacts might not hinder climate engagement, if campaigners communicate that there will be “some” serious impacts.

Interdependence of Distances

Our results indicated that temporally distant news article resulted in greater scope uncertainty and perception of climate change impacts in more distant future. Also, presenting

higher scope uncertainty led to lower temporal distance. It can be suggested that perceiving higher uncertainty of climate change impacts may have diminished perceived threat, which then allowed for acceptance of an imminent climate change threat. Another potential explanation could be related to the perceived credibility of the presented news article. Participants could have been somewhat familiar with the discourse on uncertainty of the scope of climate change impacts prior to the study. Hence, they might have found the uncertain news article as more realistic, or more believable. This then might have motivated them to acknowledge climate change as a more “concrete” problem, i.e., perceiving it as temporally more proximal. Past literature suggested interdependence between different distances (Chen et al., 2020). Therefore, when communicating impacts of climate change, focusing on one aspect seem to modify other dimensions as well. However, these results imply that the interaction between distances may be more complex than simply reinforcing each other.

Path Model

The integrated path model tested in the present study was a novel attempt to bridge the gap between psychological distance and collective action frameworks. Although model fit was not satisfactory, Study 2 replicated the role of support for system reform as a key component of environmental activism framework found in Study 1. Participative efficacy appeared as the strongest proximal determinant of local activism intentions in line with the previous literature (Bamberg et al., 2015). Hence, the importance of the role of instrumental pathway to promote activism, compared to motivational route, was also supported. Configural invariance of the across distal and proximal temporal distance framing, and partial invariance across high and low uncertainty framings confirmed the consistency of the path model.

Although emotions had strong links to movement identification and support system reform, they fell short of explaining activism intentions in Study 2, which is in line with previous studies on environmental activism and with Study 1 (Bamberg et al., 2015). Fear was the only significant predictor of activism intentions, although the effect was weak. The present study highlighted climate change impacts without presenting any responsible entity. This might provide some explanation to the nonsignificant path from anger or guilt to action intentions. Indeed, if there was no concretely defined activity caused by a specific person or entity, including oneself, anger and guilt might be less relevant to the solution of the problem (Karasawa, 2001). Hence, as previous studies on climate change suggested, fear would be a more appropriate response to climate impacts presented without attributing responsibility to some group or entity (Van Zomeren et al., 2010). However, the link from fear to activism intentions was marginal, so this result should be interpreted with caution. It should also be noted that eliciting negative emotions such as guilt should not be the purpose of climate change messages, unless implemented with messages highlighting the individual contribution. A qualitative research among climate activists revealed that fear, but not guilt, was shown to be the propelling emotion among environmental activists, whereby the paralysing effect of fear was managed and channelled into action by hopeful feelings (Kleres & Wettergren, 2017).

A final thing to note concerns the uncertainty manipulation in the present study. Previous research established that climate change scepticism, primarily trend and impact uncertainty are strongly related to political beliefs (Smith & Mayer, 2019). This result was also replicated in the present study. It could be that since impact and trend uncertainty are more interlinked with worldviews, they are more difficult to manipulate than scope uncertainty. Indeed, presenting scientific consensus on climate change impacts and existence met resistance and tended to

polarise opinions across political spectrum (Ma et al., 2019). Therefore, the null results on the effects of scope uncertainty manipulation in the present study imply that incorporating scope uncertainty to climate change communication is less likely to result in political divide.

In Study 2, impact of hypothetical and temporal distance manipulations on climate change engagement was examined. No significant effect of distance manipulations in motivating climate activism was observed, whereas political ideology appeared as the moderator of the temporal distance framing on activism intentions but not movement identification. Having examine the role of two distances on collective action variables in Study 2, Study 3 examined the impact of spatial distance framing as the next step.

Study 2 tested an environmental activism framework with perceived uncertainty and temporal distance of climate change as the main predictors. In Study 3, spatial and social distance were also incorporated into the path model, as well as risk perceptions and action intentions at both local and global level.

4.6 Study 3: Overview

Previous research revealed lowering spatial distance could be effective in motivating climate change action (Scannell & Gifford, 2013) although potential moderators of this effect such as political ideology and prior climate change beliefs were also identified (Rickard et al., 2016). Having tested the effect of temporal distance and uncertainty framings on climate change engagement, a similar approach will be utilized to test the effectiveness of spatial distance framing. There is evidence that proximal spatial framing resulted in greater climate change engagement for conservatives but not for liberals, whose attitudes were robust to distance framings (Rickard et al., 2016; Chu & Yang, 2018). Other studies found no effect of spatial framing on conservatives but positive effect of proximal framing on liberals (Yang et al., 2020).

The primary aim of the present study is to examine the impact of spatial distance framing on environmental activism as well as test an integrated path model as in Studies 1-2. In addition to the variables explored in Study 2, local and global aspects of risk perceptions and activism intentions are included into path model. Similar to Study 2, the role of political orientation on the effect of distance framing is also examined. Given the mixed results on the main effect of distance framing (Spence et al., 2012; Chapman et al., 2016) it is expected that presenting local impacts will be more useful in increasing risk perceptions for the closer proximity, whereas highlighting distant/global impacts will increase global risk perceptions. Similarly, local action intentions, which is defined as participation in TT movement, is expected to be greater for local impacts condition whereas global impacts condition will be more effective in motivating global activism.

Concerning the moderating role of political ideology in the framing literature, the past findings present a mixed picture. Hence, it is tentatively expected that those with more liberal views will be less affected by framing, whereas right-wing participants' attitudes and intentions will be improved by proximal framing.

Experimental Hypotheses

H1.1 Local (vs. global) framing will decrease perceived global risk but increase perceived local risk.

H1.2 Local (vs. global) framing will decrease global activism intentions but increase local activism intentions.

Exploratory Analyses

H1.3 The effect of distance framing on collective action variables, global, and local risk perceptions might be moderated by political ideology such that proximal (vs. distal) framing

would result in greater local and global risk perceptions, collective action intentions, movement identification, efficacy beliefs, and environmental emotions for conservatives.

Path Model

H2.1 Perceived psychological distance will be negatively linked to local and global risk perceptions, which in turn will be positively linked to support for system reform.

H2.2 The relationship between support for system reform and activism intentions will be mediated by collective emotions, movement identification, and efficacy beliefs.

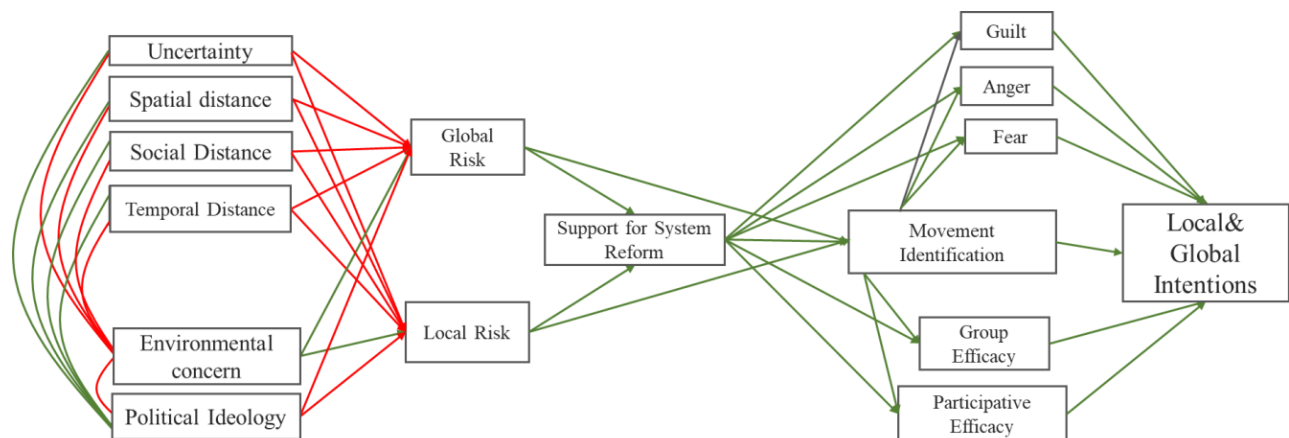
H2.3 Perceived psychological distance will be negatively related to environmental concern.

H2.4 Perceived psychological distance will be positively related to political ideology.

H2.5 Environmental concern and political ideology will be negatively linked to support for system reform.

Figure 4.4

Hypothesised Path Model



Note. Red lines (vs. green) represent hypothesised negative (vs.) positive relationship.

4.7 Study 3: Methods

Participants and Design

British citizens over 18 were recruited via the Prolific Academic research platform. There were no other criteria for the participation in the study. Overall, 210 participants took part in the experiment. At the end of the study, they were asked to summarise the content of the news article with a short sentence as an attention check. 11 participants failed to complete the attention check successfully, i.e., provided irrelevant or insufficient answers, and were excluded from the study. The final sample size was 199 (107 females, 90 males, 2 not reported), *Mean age* = 36.04, *SD* = 12.35. Participants were compensated for their participation. The sample size was determined based on the recommendations for minimum number of participants for SEM, $N = 200$ as in Study 1 and 2 (Boomsma, 2001).

The experiment utilized a 2 condition (low vs. high spatial distance) between-subjects design where climate change impacts at a local (vs. global) level were presented via news articles. Sensitivity power analyses was conducted with G*Power for main effects and interactions (Faul et al., 2007). The results revealed that a sample size of 210 would be sufficient to detect an effect of moderate magnitude (Cohen's $f = .194$) where α error level was set at .05 and required power ($1 - \beta$ err prob) at .80.

Procedure

After providing consent for the study, participants read news articles presenting predictions on future impacts of the local (i.e., in the UK) vs. global (i.e., worldwide) impacts of climate change. Participants' comprehension of the news articles was confirmed with attention checks following the news articles where they were asked to summarise the news articles in one sentence. After participants answered the questionnaire composed of the scales in Study 2, with

additional measures of risk perceptions, and four dimensions of psychological distance from the climate change. Then they were debriefed and thanked for taking part in the study.

Materials and Measures

Spatial Distance Manipulation

Two news articles depicting local or global climate change impacts were designed for the purposes of the present study. Visuals for the news articles were adapted from various news outlets (See Study 2, Procedure). To minimise discrepancies between the two conditions, images depicted the same environmental issue (i.e., flooding). Local (vs. global) impact scenario described flooding events and projected impacts for the UK (vs. worldwide). Texts were adapted from Brügger et al.'s (2016) study. As in Study 2, Reuters news website was used as the template for the articles (See Appendix A for the news articles). In addition to those used in Study 2, several measures were introduced which are described below. Unless indicated otherwise, a 5-point Likert scale was used for each measure, where responses ranged from 1 = *extremely unlikely* to 5 = *extremely likely*.

Climate Change Risk Perceptions

Perceived risk of climate change was measured with a 6-item scale adapted from Awareness of Consequences (AC) scale (Stern et al., 1999). Three items pertained to local and three pertained to global impacts, which were labelled as local (vs. global) risk perception. Sample items include “Severe water shortages will occur where I live/globally” (local/global).

Action Intentions

Intention to engage in environmental activism was measured with a 5-item scale which was slightly modified upon Study 1 and Study 2. The first three items were related to TT movement activities as in previous studies, i.e., a “local activism”, whereas the latter two items

were added to assess activism intentions on a broader level, i.e., “global activism”. Sample item for global action intentions measure is: “I would be willing to sign a petition to push the governments worldwide to legislate for policies that slow or stop climate change”.

Psychological Distance

An 11-item composite scale was used to measure psychological distance, including social (3-item), spatial (2-item), temporal (1-item), and hypothetical (5-item) distance subscales (Poortinga et al., 2011). Temporal distance was measured with the scale used in Study 2. Sample items for other dimensions are “My local area is likely to be affected by climate change” (spatial/reversed), “The seriousness of climate change is exaggerated” (hypothetical/uncertainty)”, “Climate change is likely to have a big impact on people like me (social)”.

4.8 Study 3: Results

Descriptive statistics for each condition can be found on Table 4.9. Correlations between variables are presented in Table 4.10.

Table 4.9

Descriptive Statistics for Total Sample and Across Conditions

	Local condition M (SD)		Global condition M (SD)		F	p	Partial Eta2	Total sample M (SD)		Cronbach's alpha
Spatial Distance	2.07	(.95)	2.59	.94	14.989	<.001	.071	2.33	.98	.62
Social Distance	1.86	(.68)	2.38	.73	26.395	<.001	.118	2.12	.75	.55*
Temporal Distance (year)	2050.97	(24.24)	2049.26	(23.48)	.255	.614	.001	2050.11	23.81	-
Uncertainty	1.91	(.74)	1.89	(.76)	.032	.858	<.001	1.90	.75	.77
Local risk	3.57	(.94)	3.20	(.96)	7.693	.006	.038	3.39	.96	.85
Global risk	4.12	(.87)	4.00	(.88)	.954	.330	.005	4.06	.87	.86
Political Ideology	3.21	(1.46)	3.32	(1.43)	.277	.600	.001	3.27	1.44	-
Environmental Concern	3.87	(.66)	3.67	(.65)	4.524	.035	.022	3.77	.66	.78
Support for System Reform	3.95	(.74)	3.96	(.65)	.003	.956	<.001	3.96	.69	.77
Movement Identification	3.59	(.89)	3.53	(.84)	.248	.619	.001	3.56	.86	.92
Guilt	4.19	(1.01)	4.08	(1.05)	.588	.444	.003	4.14	1.03	-
Anger	3.97	(1.07)	4.01	(1.08)	.070	.792	<.001	3.99	1.07	-
Fear	4.18	(.95)	4.05	(1.11)	.805	.371	.004	4.12	1.04	-
Group Efficacy	3.91	(.81)	3.94	(.70)	.083	.773	<.001	3.92	.75	.89*
Participative Efficacy	3.14	(.77)	3.17	(.77)	.047	.829	<.001	3.15	.77	.75
Local activism intentions	2.71	(.98)	2.81	(.98)	.449	.503	.002	3.32	.95	.92
Global activism intentions	3.27	(.96)	3.36	(.93)	.421	.517	.002	2.76	.98	.58*

Note. * Spearman-Brown coefficient. Variables in bold were significantly different across conditions.

A multivariate analysis of variance (MANOVA) was run to test the effect of distance manipulation on perceived distances. The results showed a significant multivariate effect of distance framing on distances, $F(4, 194) = 8.412$, $\eta p^2 = .148$, $p < .001$. An additional MANOVA was run to test the effect of distance manipulation on dependent variables. Multivariate tests showed a significant overall effect of manipulation, $F(11, 187) = 2.114$, $\eta p^2 = .111$, $p = .021$.

Perceived spatial distance and social distance were higher and perceived local risk was lower in the high (vs. low) spatial distance condition. That is, participants perceived climate change as more socially and spatially distant and anticipated a lesser local risk when presented with global (vs. local) impacts. Mean scores on collective action variables and other dependent variables were not significantly different across conditions. Thus, our findings partially

supported H1.1's prediction that the local framing would result in higher perceived local risk. The results did not support H1.2, which proposed that the local (vs. global) framing would increase local activism intentions and lower global activism intentions. That is, distance manipulation impacted activism intentions neither at the local nor at the global level.

Table 4.10

Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Spatial Distance	-															
2. Social Distance	.63**	-														
3. Temporal Distance (year)	.16*	.22**	-													
4. Uncertainty	.26**	.32**	.28**	-												
5. Local risk	-.36**	-.39**	-.31**	-.42**	-											
6. Global risk	-.28**	-.31**	-.33**	-.53**	.72**	-										
7. Political Ideology	.21**	.16*	.20**	.26**	-.25**	-.29**	-									
8. Environmental Concern	-.31**	-.38**	-.29**	-.48**	.44**	.59**	-.30**	-								
9. Support for System Reform	-.25**	-.28**	-.24**	-.42**	.52**	.59**	-.32**	.46**	-							
10. Movement Identification	-.25**	-.25**	-.21**	-.44**	.42**	.52**	-.45**	.38**	.61**	-						
11. Guilt	-.20**	-.17*	-.19**	-.31**	.42**	.53**	-.22**	.43**	.49**	.36**	-					
12. Anger	-.12	-.14	-.23**	-.38**	.41**	.58**	-.23**	.49**	.57**	.50**	.67**	-				
13. Fear	-.24**	-.20**	-.19**	-.40**	.47**	.60**	-.24**	.42**	.60**	.54**	.56**	.60**	-			
14. Group Efficacy	-.23**	-.22**	-.08	-.44**	.28**	.33**	-.30**	.32**	.48**	.63**	.24**	.30**	.37**	-		
15. Participative Efficacy	-.12	-.10	-.15*	-.19**	.18**	.17*	-.26**	.12	.35**	.60**	.11	.20**	.18*	.52**	-	
16. Local intentions	-.24**	-.18*	-.18**	-.26**	.40**	.43**	-.26**	.22**	.45**	.67**	.32**	.38**	.36**	.39**	.61**	-
17. Global intentions	-.18**	-.16*	-.23**	-.44**	.46**	.55**	-.33**	.41**	.57**	.67**	.40**	.46**	.51**	.49**	.45**	.64**

** $p < 0.01$, * $p < .05$ (two-tailed).

To test Hypothesis 1.3's prediction that political ideology would interact with spatial framing, moderation analyses were run with PROCESS (v3.7). Interaction coefficients, standard deviations and 95 % confidence intervals are reported in Table 4.10. Global (vs. local) framing was coded as 1 (vs. 0). Moderation analyses revealed that proximal (vs. distal) framing resulted in lower participative efficacy for more right-wing participants. For those with left-wing political views, distance framing did not have any effect.

Table 4.11

Tests of Interaction Between Spatial Distance Framing and Ideology

Dependent Variable	B	SE	F	t	p	LLCI	ULCI
Local Risk	.033	.091	.134	.366	.715	-.1459	.2124
Global Risk	-.045	.083	.293	-.541	.589	-.2085	.1187
Movement Identification	.122	.076	2.588	1.609	.109	-.0276	.2718
Participative Efficacy	.165	.073	5.159	2.271	.024	.0217	.3084
Group Efficacy	.042	.071	.356	.597	.551	-.0978	.1827
Global Intentions	.090	.088	1.053	1.026	.306	-.0835	.2645
Local intentions	.155	.093	2.808	1.676	.095	-.0275	.3378

Note. $df_1=1$, $df_2=195$. Variables in bold indicate significant interaction.

Conditional Effects of Spatial Distance Framing on Participative Efficacy

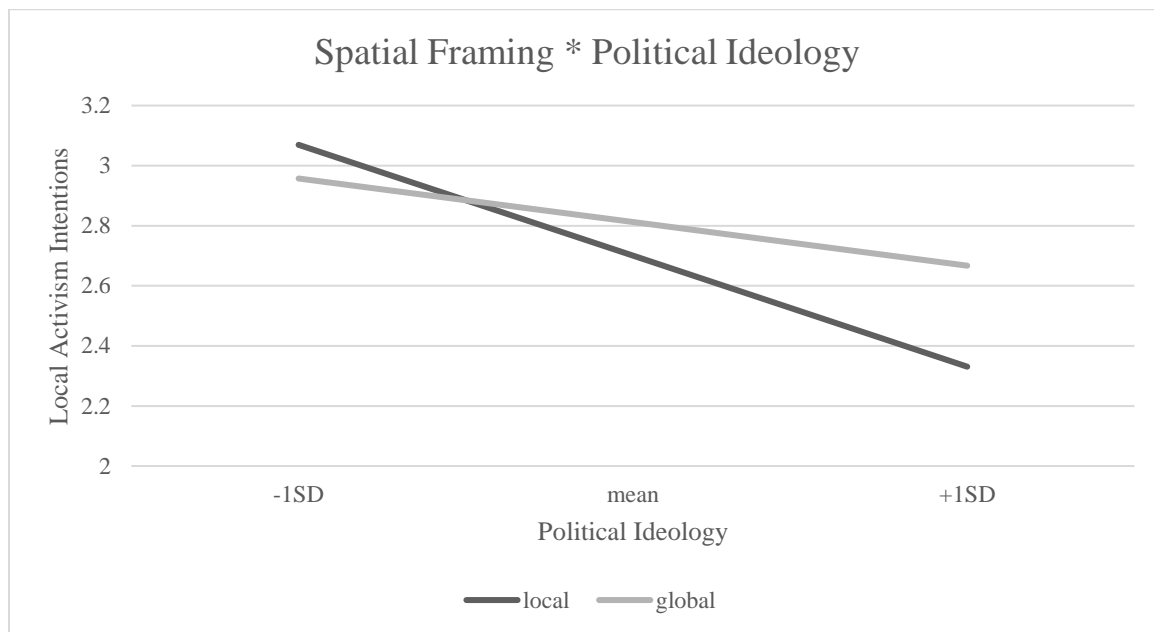
Political Ideology	B	SE	t	p	LLCI	ULCI
1.82 (left)	-.200	.148	-1.349	.179	-.4924	.0924
3.27 (mid)	.038	.105	.367	.714	-.1681	.2448
4.71 (right)	.277	.148	1.867	.063	-.0156	.5691

Conditional Effects of Spatial Distance Framing on Local Activism Intentions

Political Ideology	B	SE	t	p	LLCI	ULCI
1.82 (left)	-.112	.189	-.593	.554	-.4845	.2606
3.27 (mid)	.112	.133	.841	.402	-.1509	.3752
4.71 (right)	.336	.189	1.780	.077	-.0362	.7087

Figure 4.5

Interaction Between Political Ideology and Spatial Framing on Participative Efficacy



Path Model Test

The path model was tested with R software, the *lavaan* package (Rosseel, 2012). Experimental condition was not introduced to the model as the main predictor, as the main effect of condition was observed only for the local risk perceptions but not group-based dependent variables and support for system reform. Instead, perceived distances were utilised as the predictor variables. The results partially confirmed H2.1. Global and local risk perceptions were predicted by perceived uncertainty and temporal distance of climate change, where the former had a stronger relationship to risk perceptions whereas the other distances did not. Spatial distance only had a marginal negative link to local risk perceptions. Both forms of risk perceptions then predicted support for system reform, although the effect was stronger for global risk. Based on the threshold values in Hu and Bentler (1999), i.e., $CFI \geq 0.95$, $TLI \geq .95$, $SRMR \leq .80$, $RMSEA \leq .80$, the model did not provide a good fit to the data $\chi^2(75) = .181.814$, $CFI = .935$, $RMSEA = .085$ [90% CI = .069, .100], $SRMR = .090$ (See Figure 4.6 for standardised path coefficients).

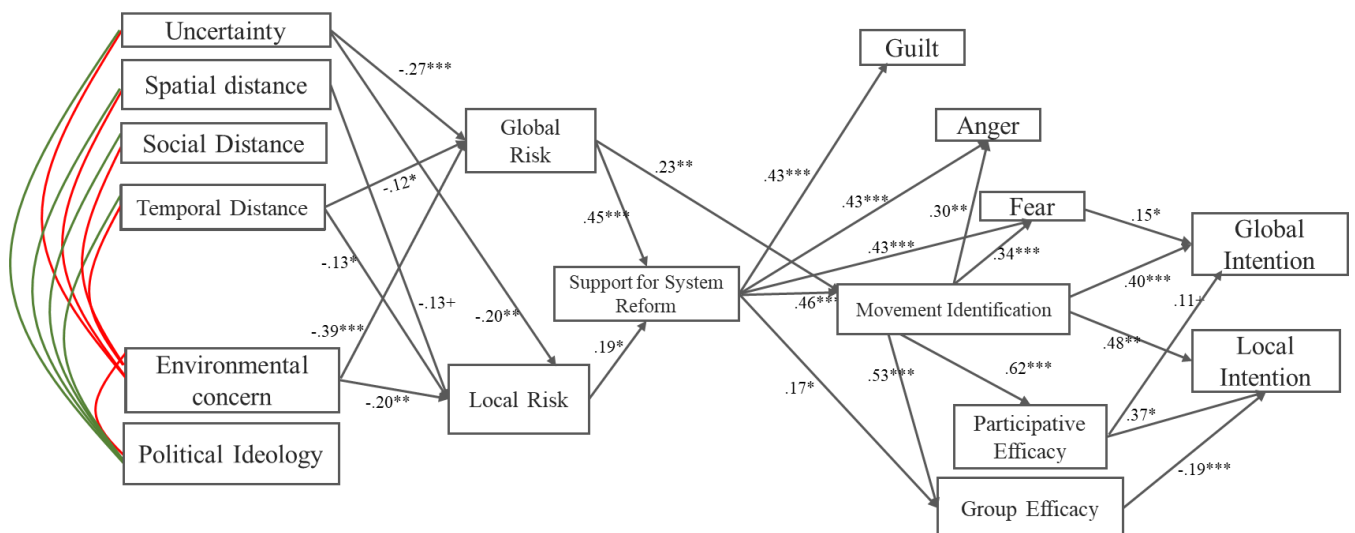
Two multiple mediation analyses were conducted with PROCESS v3.7 to test H2.2's prediction that the link between support for system reform and action intentions would be mediated by collective action variables. The results showed full mediation of the link between support for system reform and local activism by movement identification group and participative efficacy, and partial mediation of the relationship between support for system reform and global activism intentions by movement identification (see Table 4.12 for total, direct and indirect effects for each mediator variable). H2.3, which predicted that perceived psychological distance will be positively related to political ideology, was supported. Findings also supported H2.4's proposition perceived psychological distance will be positively related to political ideology. That is, all dimensions of psychological distance were related negatively to environmental concern and positively to right-wing political ideology (see Table 4.11 for covariations). H2.5's prediction that environmental concern and political ideology will be negatively linked to support for system reform was partially confirmed. From the covariations on the path model, it can be observed that environmental concern, but not political ideology, was linked to support for system reform.

Given the absence of significant effects on the key dependent variables, *perceived* (measured) psychological distances were included as the independent variables into the model instead of distance manipulation. Yet, this implied to compare participants who had not been presented with the exact same information. Hence, similar to Study 2, a multigroup analysis was run (low distance vs. high distance manipulation) to ensure that the path model showed the same goodness of fit in both conditions. Specifically, configural and scalar invariance was tested across nested models (i.e., conditions). Fit statistics of nested models are presented in Table 4.13. Based on recommendations of Milfont and Fisher (2010), thresholds for the fit index differences were set as .01, .01, and .02 for CFI, GH, and NCI respectively, to conclude about invariance (i.e., when the constrained and less constrained models differed by less than

these values, they could be considered as respecting invariance). Based on those criteria, the invariance of configural model (compared to baseline) was accepted, which means that the relationships between the variables in the path model were similar across conditions of spatial distance. Unsurprisingly, scalar invariance was rejected, i.e., the mean values of the variables differed across condition, which corresponds to the findings of the MANOVA previously run. As in Study 1 and Study 2, metric invariance test was omitted since only measured variables were used in the path model.

Figure 4.6

Path Model Test Results



Note. $*** p < .001$, $** p < .01$, $* p < .05$, $+ p < .10$.

Table 4.12

Covariances on Path Model

	1	2	3	4	5
1. Political Ideology					
2. Environmental Concern	$-.30^{**}$				
3. Uncertainty	$.26^{***}$	$-.48^{***}$			
4. Temporal distance	$.20^{**}$	$-.19^{**}$	$.27^{***}$		
5. Spatial distance	$.16^{**}$	$-.31^{**}$	$.26^{***}$	$.16^*$	
6. Social distance	$.19^*$	$-.38^{**}$	$.32^{***}$	$.22^{**}$	$.63^{***}$

Note. $* p < .05$, $** p < .01$, $*** p < .001$ (two-tailed).

Table 4.13

Tests of Mediation Between Support for System Reform and Actions Intentions

Outcome: Local activism intentions						
	B	se	t	p	LLCI	ULCI
Total Effect	.633	.090	7.053	<.001	.4559	.8098
Direct Effect	.064	.101	.635	.526	-.1347	.2626
Standardised indirect effects			B	BootSE	BootLLCI	BootULCI
Total			.404	.069	.2618	.5337
Movement Identification			.284	.057	.1764	.3963
Group Efficacy			-.074	.039	-.1623	-.0071
Participative Efficacy			.132	.036	.0702	.2106
Guilt			.060	.041	-.0306	.1311
Anger			.006	.057	-.1184	.1069
Fear			-.0043	.0467	-.0843	.1013
Outcome: Global activism intentions						
	B	se	t	p	LLCI	ULCI
Total Effect	.815	.078	10.409	<.001	.6604	.9692
Direct Effect	.292	.100	2.928	.004	.0953	.4887
Standardized indirect effects			B	BootSE	BootLLCI	BootULCI
Total			.382	.056	.2727	.4896
Movement Identification			.217	.060	.1047	.3435
Group Efficacy			.025	.034	-.0447	.0911
Participative Efficacy			.036	.025	-.0100	.0899
Guilt			.037	.034	-.0261	.1082
Anger			.011	.045	-.0768	.0991
Fear			.056	.047	-.0278	.1626

Table 4.14

Fit Statistics of Nested Models

Model	χ^2	df	χ^2/df	CFI	GH	NCI	RMSEA	[90% CI]	SRMR	$\Delta\chi^2$	ΔCFI	ΔGH	ΔNCI	Decision
Configural (Baseline)	267.040	150	1.780	.931	.935	.744	.089	.071, .106	.096	-	-	-	-	Accept
Scalar	328.069	167	1.964	.906	.913	.666	.098	.083, .114	.117	61.029	-.025	-.022	-.078	Reject

Notes. CFI = Comparative Fit Index; GH = Gamma Hat; NCI = Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Residual. Metric invariance analysis was omitted, as there were no latent variables in the model and only observed variables were used.

4.9 Study 3: Discussion

The present study tested the effectiveness of local (vs. global) framing of climate change impacts on willingness to participate in climate activism among a British sample. The results showed that spatially proximate framing, that is, presenting a news article covering climate change impacts for the UK (vs. the globe) resulted in greater risk perceptions for local area, and perception of climate change impacts as spatially and socially closer. Complementing Study 2, the present experiment compared all four dimensions of perceived distance and their links to environmental variables.

Dimensions of Psychological Distance

Although the path model test did not indicate good fit, the links between variables were mostly consistent with the presented hypotheses and past literature. In terms of their links to dependent variables in the path model, uncertainty was the most significant negative predictor of both local and global risk perceptions, followed by temporal distance, in line with past findings (Jones et al., 2017). Perceived spatial distance but not social distance had a marginally negative link to local risk, whereas the manipulation of spatially close framing increased local risk. The results indicated that social distance was also higher for spatially distant framing, suggesting covariance of social and spatial distances in response to distance framing. Covariances also revealed a positive link between two distances, confirming previous research which indicated a strong link between social and spatial distance of climate change (Macdonald et al., 2015; Stephan et al., 2011). However, some studies were not successful in manipulating social distance by spatial distance framings (Duan et al., 2019). Duan et al. (2019) utilized abstract vs. concrete climate change images without referencing to a specific country or a geographical region (Rickard et al., 2016). Hence, the significant effect of the manipulation on social distance in the present study could be attributed to the use of photographs, which arguably cued the social distance and dissimilarity between the

participants (i.e., the UK citizens) and the presented population (i.e., people in India) more vividly. The present study failed to find a significant link between social distance to any of the risk perceptions while spatial distance had a marginal link to local risk. Both distances had similar correlations to other dependent variables, hence this disparity may suggest that spatial distance encapsulates social distance. Future research could test this implication explicitly by examining the conceptual distinction between the two.

It should also be noted that our distant/global framing did not focus on a single country or a geographical region, but multiple locations were mentioned as impacted climate change. Global framing may have represented climate change as a worldwide threat affecting many countries and hence making it more difficult to discount climate change as confined to a certain region, which renders the framing as no longer “distant”. This could have reduced the effect of distance framing on other dependent variables, e.g., activism intentions. Future studies may compare if distant vs. global framings, i.e., targeting one specific foreign country vs. presenting it as a more global threat, could create a difference in climate change engagement. The lack of main effects on dependent variables parallels the results of some past studies where distance manipulation was effective in inducing risk but not action intentions (Busse & Menzel, 2014). Similarly, perceived distances and risk perceptions but not collective action variables were impacted in response to distance framing. Also, efficacy beliefs were the key predictors of activism, especially at the local level. Hence, future studies could test whether complementing low distance framing with efficacy-based messages is more effective in improving climate change engagement.

Political Ideology

The present study also revealed that participative efficacy decreased in response to local framing for those with conservatives but not for liberals. Past research documented boomerang effects and motivated denial among right-wing audience, where climate change

persuasion efforts in general tend to amplify attitudinal gap along political spectrum (Zhou, 2016). However, previous studies on spatial distance failed to find boomerang effects, and instead found greater engagement in response to proximal framing (Rickard et al., 2016) or lack of framing effects (Yang et al., 2020) among conservatives. In contrast, the current findings provided some evidence regarding boomerang/backfire effects of proximal spatial framing for participative efficacy, a key predictor of activism intentions. However, the interaction effect was only significant for participative efficacy and marginal for local activism intentions but not for activism intentions or other group-based variables. Therefore, the evidence should not be considered as indicating a consistent effect.

Nevertheless, the significant interaction on participative efficacy could be explained as follows. Right-wing political ideology was negatively linked to perceived local risk in the present study. In relation to this, global effects condition might have been perceived as more realistic by conservatives than local impacts, whereas local impacts may have sounded more trivial than global impacts. Alternatively, the local impacts news could have been perceived as more alarming and concerning due to spatial proximity, hence leading to denial among conservatives. Although these are opposite reactions, both may have led to the same outcome, i.e., reactance to the presented message. As a result, the relative effectiveness of the presented environmental movement may have become more questionable for conservatives. Based on lower risk perceptions among conservatives in general, trivialisation explanation could be more plausible. However, the denial mechanism could also play a role in inhibiting risk perceptions for local framing in general, which is likely to operate without conscious awareness and much more difficult to identify with self-report measures. More research is needed to disentangle the effects of denial and trivialisation on climate change engagement.

A marginal interaction of framing by political ideology was observed for local activism intentions. However, since this effect was marginal, it could be interpreted as a weak

indicator. Nevertheless, combined with participative efficacy, this finding implies boomerang effects, particularly in relation to local and personal efforts. Hence, the disparity between the present findings and past studies which did not observe backfiring effects for spatial framing could be attributed to the difference in the target outcome in the present study which relates to a local grassroots environmental group. It could be possible that local efforts for mitigation were perceived as more trivial by conservatives in local (vs. global) impacts condition, due to discounting or denial of local impacts described in the previous paragraph. Another important point is that the boomerang effects were not observed for the group-based efficacy, which implies diminished importance of personal, but not group-based, contribution among conservatives in response to proximal framing. However, participative efficacy was more strongly linked to local activism intentions than group-based efficacy. Hence, it is not surprising to observe boomerang effects more strongly for participative than group-based efficacy, where inconsistency of interaction effects could be explained through discounting or trivialisation mechanisms.

On the other hand, these results could be interpreted as indicating the effectiveness of global framing, rather than the negative effect of local framing per se. To clarify this, a control group could be employed in future studies. All in all, these results indicate that it might be a fruitful strategy to focus on impacts taking place in distant geographies, and to present more global action strategies to improve climate change attitudes among politically conservative.

Concerning the path model, Study 3 replicated the findings of Studies 1 and 2 where the participative (vs. group-based) efficacy was the strongest predictor of local but not global intentions. Hence, the importance of participative efficacy was established irrespective of the framing content (responsibility, temporal distance, spatial distance, and uncertainty of climate change impacts) for locally based climate action.

Global vs. Local Risk and Action

In the present study, perceived risk and activism intentions were explored at the global and local level which were both motivated by movement identification. Our results demonstrated that willingness to participate in TT activities (i.e., local activism) was predicted by participative and group efficacy beliefs whereas global climate activism intentions were predicted most strongly by movement identification, and weakly by fear and participative efficacy. In other words, motivational pathway was not linked to local (vs. global) activism, which is a more concrete and well-defined form of pro-environmental behaviour. Past models of collective action also emphasized the crucial role of efficacy, primarily its participative aspect, in motivating various forms of environmental activism such as protesting and willingness to pay, and volunteering for green groups (Lubell, 2002). Global activism, on the other hand, were predicted by identification rather than participative efficacy. This could be due to behaviours measured by global intentions scale (i.e., petition signing and protesting) having less relevance to personal efficacy considerations. Research showed that a more concrete (vs. abstract) information, i.e., describing “how” rather than “why” of the action about recycling, resulted in increased efficacy and recycling intentions (White et al., 2011). Although past research revealed that different forms of collective action were also predicted by emotions such as anger in addition to efficacy, these employed only group-based efficacy (Tausch et al., 2011). Indeed, through testing various theoretical frameworks of collective action, Bamberg et al. (2015) showed that when participative efficacy was included, emotions and group efficacy became much weaker, or nonsignificant, predictors of local activism intentions. It can be suggested that highly contextualized and more specific local actions, compared to less contextualized global actions, may have caused time, effort, and competence considerations more salient, thereby bringing instrumental pathway i.e., efficacy beliefs, to the forefront. On the other hand, the

path model test results suggest that the best way to promote action is to increase global risk perceptions. However, it is relatively difficult to change global risk perceptions by spatial framing as indicated by these results. Climate change attracts high media coverage, and it could be possible that participants were previously exposed to news or information concerning global impacts more frequently, compared to those mentioning local impacts. This idea is also supported by our findings where the participants had greater global risk than the local risk on average. Another notable result was that local risk perceptions did not predict support for system reform. This could offer some basis for effectiveness of local framings to motivate adaptation but not long-term mitigation or deep-seated reforms (Haden et al., 2012). should also be noted that link from fear to activism intentions was quite small compared to movement identification, and no other emotion was a significant predictor of intentions, hence implying the lesser significance of emotional pathway in climate activism, in either local or global form.

Limitations and Future Directions

Despite the efforts of matching message characteristics between conditions, there could be some level of discrepancy in terms of the seriousness of the presented climate change impacts. This was for the most part inevitable, because although the flood events were presented in the news for both conditions, it is highly likely that the participants may have been aware of the more severe impacts of flood events or greater economic difficulties and vulnerability of populations described in the global condition, compared to the UK. Considering higher levels of global (vs. local) risk perceptions among participants, this explanation holds some promise. Considering how media outlets could shape climate change attitudes, future studies may explore the role of the prior news exposure, or relative frequency of global vs. local emphasis on climate change coverage on distance framing effects. In addition, future studies could compare whether framing environmental action in terms of

highly contextualized vs. abstract manner could explain backfiring or boomerang effects observed in some studies but not in others. Also, backfiring effects might be confined to “dire” framings conveying seriousness and imminence of impacts. Not all low distance manipulations might trigger the sense of alarmism, or dismissiveness for sceptical population or for conservatives. Indeed, low distance condition in the present study explicitly laid out the impacts of climate change, complemented them with visuals and potentially produced a “dramatic” scenario, which might have led to boomerang effects. Hence, research should distinguish between framings that suggest alarmism by visuals and dramatic language, and those simply cue reduced distance through maps, or describing impacts in a more neutral language.

Chapter 5: Framing Environmental Activism: Air Pollution

5.1 Overview of the Present Chapter

The present chapter examines, in an experimental study among British citizens, whether air pollution framing can promote environmental collective action and reduce psychological distance compared to climate change framing. The past findings examined the effect of side benefits of climate change mitigation or presenting other environmental problems, e.g., air pollution on pro-environmental intentions. However, the impact of air pollution framing was not examined within the context of collective environmental action. Previous chapters tested the effect of different framings, i.e., psychological distance of climate change and responsibility of environmental degradation, in previous chapters. The present study aims to test the effectiveness of air pollution (vs. climate change) framing on collective climate action, i.e., participation in a local grassroots' environmental movement. Since air pollution is a more localised and observable problem than climate change, the present study also compares perceived psychological distance across climate change and air pollution frames.

In this experimental study, participants were presented with a brief description of climate change (vs. air pollution) as a prominent environmental issue. Then activism intentions and collective action variables, and perceived psychological distance from climate change (vs. air pollution) was measured. The results revealed a nonsignificant multivariate effect of framing on the dependent variables, except that perceived uncertainty of air pollution was higher than that of climate change. Moderation analyses revealed a nonsignificant interaction of framing by political ideology except for spatial distance, such that left-wing participants perceived air pollution as less spatially distant than climate change, whereas for right-wing participants the effect of framing was not significant. Extended collective action model in Study 3 was replicated in the present study. Path model tests

revealed lack of configural invariance across conditions. Hence, model test was run separately for air pollution and climate change conditions. Results revealed that despite a good amount of overlap of path models across conditions, there were some notable differences concerning the role of emotions, risk perceptions and perceived distances.

5.2 Introduction

As discussed in previous chapters in detail, past literature indicated that psychological distance from climate change impacts might impair sense of responsibility, efficacy, and urgency, thereby hinder mitigation efforts (McDonald et al., 2015; Markowitz & Sheriff, 2012). Anthropogenic climate change is conceptualised as one of the “wicked” environmental problems, i.e., the course of action for mitigation requires concerted effort by a multitude of actors (e.g., industry, national and supranational governments, and the public) (Bouma & McBratney, 2013). Also, climate change opinions are polarised across the political spectrum both for elected representatives and public primarily in Western Europe (McCright & Dunlap, 2011). Researchers argued that political polarisation of climate change is partly attributable to the clash between mitigation policies (i.e., regulation of industrial production, limiting greenhouse gas emissions, carbon tax) and Republican free-market ideology, which favours continuous economic growth regardless of the detrimental environmental impacts (Campbell & Kay, 2014). Moreover, biased assimilation of novel information on climate change seems to maintain and even deepen the attitude gap between conservatives and liberals (Hart & Nisbet, 2012).

In sum, climate change beliefs are tightly connected to ideological and social identities, and psychological distance from climate change impacts could impair mitigation intentions. Therefore, strengthening the communication efforts with alarmist language and highlighting dramatic impacts is likely to be ineffective at best, and to backfire at worst for impact and trend sceptics (Bain et al., 2012). Hence, past research explored alternative

approaches to promoting pro-environmental intentions and overcoming attentional biases and motivated reasoning among climate change sceptics. These studies presented climate change impacts in different ways, e.g., emphasizing health, security, and other aspects of mitigation, or other global environmental issues (e.g., air pollution, ocean acidification) some of which proved effective motivating climate change engagement. For instance, Bain et al. (2012) presented different statements highlighting climate change mitigation outcomes to American participants. That is, outcomes are framed as either economic/technological advancement, or increased societal cohesion through warmer relationships or protection from environmental and health-related hazards posed by climate change. The results showed that willingness to engage in environmental citizenship was higher for technology advancement and societal cohesion frames than climate change frame among climate change sceptics, whereas believers did not show any change in response to different frames (Bain et al., 2012).

Similarly, Myers et al. (2012) found that promoting reduction of fossil fuel usage in terms of health benefits was more effective in eliciting support compared to climate change mitigation and national security frames. Petrovic et al. (2014) showed among American participants that when air pollution is described in terms of health implications (vs. links to climate change), conservatives were more likely to show support for air pollution reduction policies. Moreover, conservatives were more likely to support mitigation efforts and believe air pollution is harmful when “fossil fuels” term was dropped from the description of air pollution impacts, indicating defensiveness against climate change discourse (Petrovic et al., 2014). Similarly, Hine et al. (2016) found among Australian participants that localising climate change impacts and dropping climate change terminology led to higher pro-environmental intentions, specifically for those dismissive of climate change.

Some studies failed to find an interaction between alternative framings and political ideology. Lockwood (2011) compared the effect of frames highlighting energy independence,

climate change, and expansion of job market on public support for renewable energy expansion and energy efficiency regulation policies among British citizens. Irrespective of political orientation, energy independence was the most effective frame whereas increased job opportunity was the least effective one.

Research also showed that certain alternative frames could lead to boomerang effects. For instance, highlighting public health implications of climate change mitigation increased hope whereas underlining potential national security threats as climate change impacts, e.g., international conflict, uncontrolled immigration, and political destabilisation, led to negative response (anger) especially among climate change sceptics (Myers et al., 2012). Moreover, hope was positively linked to support for emission reduction for the U.S. whereas anger was negatively linked to it, a result more pronounced for the climate change sceptics. It was argued that national security framing was perceived as inauthentic or exploitative of strongly held values, potentially triggering anger (Myers et al., 2012). Hence, it may be argued that issues of trust and message credibility should be considered when designing alternative climate change frames for those who are sceptical about climate change.

In addition, although studies comparing alternative framing have generally revealed that political ideology is a moderator of framing, there has not been a consistent main effect of framing across these studies. For instance, framing the goal of mitigation efforts as improvement of community ties, economic boost, or public health benefits did not result in higher willingness to engage in environmental citizenship, behavioural intentions or the levels of policy support compared to climate change frame (Bernauer & McGrath, 2016). Bernauer and McGrath (2016) went on to suggest that an overexposure to multiple frames and information in daily life indicate a sort of “pre-treatment” except for those naïve or dismissive about the issue.

Additional studies revealed a more nuanced picture of framing effects. Emphasizing public health benefits was more effective than climate change mitigation in promoting support for car use regulation (Walker et al., 2018). However, when both frames were presented to each participant, order effect was observed. Specifically, reading climate change before public health benefits frame led to less support for the reduction in personal car use, compared to the other way around, suggesting the presence of a primacy effect.

In sum, presenting the side benefits of climate change policies can improve support, depending on the targeted behaviour (mitigation vs adaptation). Also, the emphasis on health frames or energy independence has tended to be more effective than framing in terms of economic development or national security. Although numerous studies have focussed on emphasizing side benefits of advocating for climate action, such as health outcomes or economic development, results suggest that these frames have only moderate effect on people's concern about the issue (Bernauer & McGrath, 2016; McCright et al., 2016). In addition, emphasising climate change as the main problem, or even using related terms such as carbon footprint, global warming, greenhouse gas emissions, or fossil fuels, seem to build message resistance among climate change sceptics and political conservatives. In the next section, the research utilising other environmental problems, e.g., air pollution, will be described as the basis of alternative framing in the present study.

Presenting Other Environmental Problems to Motivate Action

Public support for environmental policies plays an important role in the necessary structural change for climate change mitigation. Climate change mitigation might have various additional positive outcomes such as improvement of public health and air quality and emphasising these outcomes as the main objective might enhance support for proposed policies among those unconcerned or sceptical about climate change (Nisbet, 2009).

Transition to renewable energies (solar and wind) as well as implementation of the alternative

transport methods would lower carbon emissions and air pollution, which would in turn help mitigate climate change (Mir et al., 2016). Political polarization is observed even when side benefits of climate change are mentioned, and therefore presentation of more concrete and well-defined environmental problems might be more effective in enhancing concern and motivating action. Hence, the recent research examined the impact of the communication of environmental problems other than climate change on public policy support.

Among the studies focusing on the framing specific environmental issues, air pollution is a frequently studied alternative frame. Research findings indicate that air pollution frame could be more effective than climate change frame in motivating policy support and other pro-environmental actions. For example, Mossler et al. (2017) presented five different frames to American participants, namely, carbon pollution, climate change, global warming, ocean acidification and air pollution. The results showed that air pollution frame led to highest support for mitigation policies and emission control, followed by climate change, global warming, and carbon pollution frames, which all elicited equal level of support. Ocean acidification awareness was relatively low among participants and acidification frame resulted in the lowest support (Mossler et al., 2017). These findings suggest that public knowledge of an environmental hazard should also be considered when designing appropriate alternative frames. Similarly, Hart and Feldman (2018) found that presenting air pollution (vs. climate change) as a major environmental issue resulted in higher support for government action among Republicans but not among Independents and Democrats. Feldman and Hart (2018) presented air pollution, climate change, and energy independence frames to American participants with four environmental policies in relation to enhancement of fuel efficiency, implementation of carbon tax, investment on renewables or nuclear energy. Overall, each policy except development of nuclear energy was endorsed more strongly by liberals compared to independents and conservatives. Results showed that

when the policies were presented as linked to climate change as opposed to energy independence and air pollution, conservatives exhibited lower levels of support, and perceived higher costs over benefits for all policies than liberals except nuclear energy policy (Feldman & Hart, 2018). It should be noted that among conservative participants, support for nuclear energy did not change by frame, possibly due to high levels of support for nuclear energy leading suppressing framing effects. In a more recent study, Hart and Feldman (2021) demonstrated that an air pollution (vs. climate change) frame resulted in greater willingness to participate in environmental actions such as environmental group membership and petition signing. This effect was mediated by greater perceived benefits and lower perceived costs to the society.

Message characteristics also moderated the impact of framing in some studies. For example, Mir et al. (2016) examined the effects of air pollution framing on the willingness to use greener transport options (i.e., public transport or biking) among university students in Tehran. They found that gain (vs. loss) frames increased behavioural intentions which suggests that air pollution is considered as a relatively low-risk issue (Mir et al., 2016). In sum, it is primarily among political conservatives that an air pollution frame leads to greater policy support than climate change frame. Concerning the effect of air pollution frame in a broader context, a recent field study conducted in the city of Canterbury in the UK, compared the effectiveness of the different road signs at the level crossings on engine idling behaviour. The results revealed that the message emphasising efficacy in improving air pollution was less effective than the message which highlighted the behavioural norms in reducing engine idling (Abrams et al., 2021). This finding implies that air pollution framing may not be particularly effective in motivating pro-environmental behaviour in general.

5.3 Study 4

The present study aims to test the effect of issue framing, by exploring the effectiveness of an air pollution (vs. climate change) frame on environmental activism intentions, risk perceptions, and psychological distance, and test the interaction of framing by political orientation. Air pollution is designated as the comparison frame in the present study for the following reasons. Firstly, air pollution is a well-known and global problem with large scale negative impacts, and perceived risk due to air pollution is affected from a wide range of social and contextual variables, as in climate change (Bickerstaff, 2004). Secondly, air pollution is a less politically polarising issue than climate change in terms of public support for policies (Feldman & Hart, 2018). Hence, it is expected that liberals' intentions to engage in collective action will not be impacted by framing whereas for conservatives an air pollution frame will be more effective than climate change frame. This hypothesis also means that whether there is a significant main effect of frame may depend on whether liberals are affected at all and how large an effect obtains amongst conservatives. Lastly, air pollution is represented at a more concrete level, the present study will test whether air pollution (vs. climate change) is a more psychologically close environmental problem than climate change. Therefore, similar to 2nd and 3rd studies, the present study will be employing an alternative psychological distance framing. Taken together with the lack of main effects of air pollution framing on environmental outcomes in previous studies, the possibility of a main effect is explored but not tested as a hypothesis. In addition, the same path model employed in Study 3 will be tested within the context of alternative framing (i.e., air pollution). Hence, the same hypotheses presented in Study 3 will be tested for Study 4.

Experimental Hypotheses

The overarching hypothesis is that the framing effects will be absent or weaker amongst liberals, resulting in interactions between frame and political ideology.

H1.1 For conservatives, air pollution (vs. climate change) frame will result in lower psychological distance from air pollution (vs. climate change) since air pollution framing is represented at a psychologically closer level.

H1.2 For conservatives, air pollution (vs. climate change) frame will result in greater collective action intentions, movement identification, efficacy, and environmental emotions.

Path Model Hypotheses

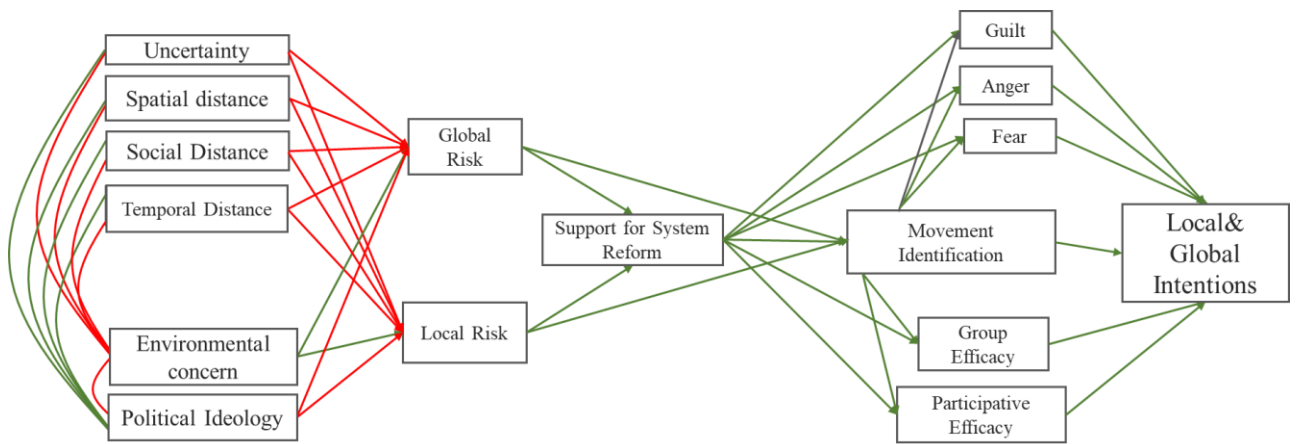
H2.1 Perceived psychological distance from the issue (air pollution/climate change) will be negatively linked to risk perceptions, which in turn will be positively linked to support for system reform.

H2.2 The relationship between support for system reform and activism intentions will be mediated by collective emotions, movement identification, and efficacy beliefs.

H2.3 Perceived psychological distance from the issue (air pollution/climate change) will be negatively related to environmental concern.

H2.4 Perceived psychological distance from the issue (air pollution/climate change) will be positively related to political ideology.

H2.5 Environmental concern and political ideology will be negatively linked to support for system reform.

Figure 5.1*Hypothesised Path Model*

Note. Red lines (vs. green) represent hypothesised negative (vs. positive) relationship.

5.4 Study 4: Method

Participants

British citizens over 18 years of age were recruited online via Prolific Academic research platform. In total, 199 participants took part in the experiment. Upon completion of the study, participants were asked to briefly describe the aims of the Transition Towns (TT) movement in a couple of sentences as an attention check. After excluding 9 who failed to complete the attention check, remaining 190 participants were included in the analyses (111 females, 76 males, 3 not reported) participated in the study, *Mean age* = 39.38, *SD* = 12.34. As in Studies 1-3, sensitivity power analysis was run with G*Power for main effects and interactions for a 2-level between subjects experimental design (Faul et al., 2007). The results revealed that a sample size of 190 is enough to find a moderate effect size (Cohen's $f = .204$) for α -error level = .05 and required power ($1-\beta$ err prob) = .80.

Design and Procedure

The present study utilised a 2-level (air pollution frame vs. climate change frame) between-subjects design. In each condition, participants read brief information about Transition Towns (TT) which was the grassroots environmental movement described in Studies 1-3. Across conditions, the goal of the TT movement was presented as either combatting air pollution or climate change. After reading the TT description, participants completed the questionnaire. At the end of the study, participants were debriefed about the aims of the study.

Materials

Experimental Manipulation

For each framing, participants read a short description of air pollution (vs. climate change) and its negative environmental impacts. This was followed by a brief description of the TT movement in relation to its aims towards air pollution (vs. climate change). Some

phrases differed across conditions to achieve manipulation, i.e., “mobilizing community action engagement around *air pollution/climate change* with the objective of bringing about a transition to a cleaner economy which would *help improve air quality/stop climate change*”. (See Appendix A for the full text for each condition). As in previous studies, each measure used a Likert type scale, where responses ranged from 1= strongly disagree, 5 = strongly agree, except temporal distance and political ideology scale.

Measures

The measures for political ideology, support for system reform, and environmental concern were the same as those used in Studies 2 and 3. Risk perceptions, psychological distance, and collective action variables were measured with scales adapted from those in Study 3. For the climate change condition, scales in Study 3 were used, except activism intentions and uncertainty/hypothetical distance (see below). For the air pollution condition, scales for risk perceptions, psychological distance, and collective action variables were slightly adapted in line with air pollution context (see Appendix A, Study 4 Measures for all scales). The aim of the present study was to examine psychological distance, risk perceptions and group-based indicators of activism intentions for climate change or air pollution. Hence, measures were adapted to assess each construct in relation to the presented issue. These adaptations were kept to minimum (i.e., changing the name of the environmental problem) to reduce the discrepancies in measurement.

Hypothetical Distance

The hypothetical distance scale consisted of the second and fourth items from the uncertainty scale used in Study 3. These are: “The seriousness of climate change/air pollution is exaggerated” and “It is uncertain what the effects of climate change/air pollution would be”.

Activism Intentions

The 6-item measure of collective action was adapted from Study 3 with an additional item, i.e., “I am willing to donate to environmental organizations aiming to enforce governments for reduction of carbon footprint/improvement of air quality”.

5.5 Study 4 Results

Descriptive statistics for conditions and for the total sample are presented in Table 5.1.

Reliability statistics were within acceptable range for all scales (Cronbach’s alpha > 0.7) except social and spatial distance scales. Correlations between variables are reported in Table 5.2.

Table 5.1

Descriptive Statistics

	Air Pollution (N=93)	Climate Change (N=97)	Total	Cronbach's
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	alpha
Social Distance	2.48 (.74)	2.45 (.84)	2.46 (.79)	.48
Spatial Distance	2.48 (.99)	2.3 (.98)	2.39 (.99)	.46*
Temporal Distance	2046.77 (23.7)	2056.6 (28.87)	2051.79 (26.85)	-
Uncertainty	2.36 (.92)	2.14 (.78)	2.48 (.96)	.53*
Local Risk	3.49 (.97)	3.4 (.96)	3.44 (.96)	.87
Global Risk	4.04 (.81)	3.97 (.84)	4.01 (.82)	.82
Political Ideology	3.55 (1.36)	3.48 (1.29)	3.52 (1.32)	.82
Environmental Concern	3.61 (.74)	3.71 (.68)	3.66 (.71)	.80
Support for System Reform	3.9 (.75)	3.97 (.69)	3.94 (.72)	.87
Movement Identification	3.45 (.84)	3.55 (.86)	3.5 (.85)	.93
Guilt	4.14 (.95)	4.09 (1.11)	4.12 (1.03)	-
Anger	3.89 (.98)	3.93 (1.02)	3.91 (1)	-
Fear	4.00 (.98)	3.99 (1.03)	3.99 (1)	-
Participative Efficacy	2.97 (.75)	2.99 (.78)	2.98 (.76)	.77
Group Efficacy	3.77 (.92)	3.94 (.8)	3.86 (.86)	.87*
Global Intentions	3.08 (.92)	3.11 (1.05)	3.09 (.98)	.77
Local Intentions	2.50 (0.92)	2.61 (.99)	2.55 (.95)	.88

Note. *Spearman-Brown coefficient. The variables in bold were significantly different across frames.

The main effect of frame was tested using MANOVA. Issue framing was designated as the independent variable while environmental concern, perceived distances, risk perceptions, support for system reform, and group-based variables were designated as dependent variables. Political ideology was included as a continuous moderator of framing effects. The results revealed a nonsignificant multivariate effect of condition on dependent variables, $F(15, 163) = 1.060, p = .398, \eta^2 = .089$, and a nonsignificant interaction between political ideology and condition, $F(75, 784.963) = 1.012, p = .454, \eta^2 = .085$, but there was a significant multivariate main effect of political ideology on dependent variables, $F(90, 923.261) = 1.588, p = .001, \eta^2 = .126$.

In terms of hypothesis testing, H1.1's prediction that conservatives would express lower psychological distance in air pollution (vs. climate change) condition was not supported by multivariate interaction results. In other words, the impact of framing on any psychological distance, was not dependent upon political ideology. H1.2, which proposed that the air pollution (vs. climate change) framing would result in higher scores on collective action variables among conservatives, was not supported. Hence, the interaction of framing by political ideology was nonsignificant for all dependent variables. Although explicit hypotheses were not tested, MANOVA results suggested that climate change uncertainty was lower than air pollution uncertainty (see Table 5.2).

Table 5.2

Univariate Effects of Framing Condition (Air Quality vs. Climate Change)

Dependent Variables	Condition			Ideology			Condition * Ideology		
	F	p	Partial Eta Squared	F	p	Partial Eta Squared	F	p	Partial Eta Squared
Social Distance	.041	.840	.000	3.762	.002	.113	.859	.510	.024
Spatial Distance	2.309	.130	.013	2.721	.015	.084	1.602	.162	.043
Temporal Distance	2.361	.126	.013	5.322	.000	.153	1.455	.207	.039
Uncertainty	11.274	.001	.060	8.121	.000	.216	.372	.868	.010
Local Risk	.567	.452	.003	2.640	.018	.082	.109	.990	.003
Global Risk	.029	.864	.000	7.072	.000	.193	.505	.772	.014
Environmental Concern	2.272	.134	.013	6.581	.000	.182	.473	.796	.013
Support for System Reform	.096	.757	.001	4.425	.000	.130	.238	.945	.007
Movement Identification	.014	.907	.000	5.693	.000	.162	.491	.782	.014
Guilt	.008	.930	.000	5.717	.000	.162	.240	.944	.007
Anger	.311	.578	.002	5.490	.000	.157	.234	.947	.007
Fear	.418	.519	.002	5.896	.000	.167	.975	.435	.027
Participative Efficacy	.000	.990	.000	.969	.448	.032	.792	.556	.022
Group Efficacy	.960	.329	.005	3.448	.003	.105	.173	.972	.005
Global Intentions	.001	.976	.000	3.753	.002	.113	.071	.996	.002
Local Intentions	.194	.660	.001	1.195	.311	.039	.338	.890	.009

Note. The variables in bold were significantly different across frames.

Table 5.3 below shows the zero-order correlations among the variables. Notable amongst these is the quite large correlations between risk perceptions, emotions and psychological distance, and a comparatively small correlation between political ideology and group-based variables. More important is that with the possible exception of that between local and global risk (.81), no correlations were so large as to suggest problems of multicollinearity or redundancy.

Table 5.3

Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Social Distance																
2. Spatial Distance	.60***															
3. Temporal Distance	.37***	.26***														
4. Uncertainty	.45***	.43***	.40***													
5. Local Risk	-.55***	-.51***	-.48***	-.43***												
6. Global Risk	-.55***	-.40***	-.54***	-.55***	.81***											
7. Political Ideology	.29***	.19**	.28***	.46***	-.20**	-.38***										
8. Environmental Concern	-.45***	-.42***	-.39***	-.62***	.54***	.64***	-.37***									
9. System Reform Support	-.49***	-.39***	-.45***	-.48***	.52***	.61***	-.36***	.62***								
10. Movement Identification	-.42***	-.29***	-.40***	-.45***	.49***	.50***	-.32***	.56***	.70***							
11. Guilt	-.51***	-.44***	-.42***	-.56***	.67***	.69***	-.38***	.54***	.64***	.59***						
12. Anger	-.42***	-.34***	-.36***	-.51***	.55***	.62***	-.32***	.58***	.57***	.59***	.60***					
13. Fear	-.49***	-.38***	-.31***	-.54***	.53***	.57***	-.38***	.55***	.50***	.47***	.49***	.62***				
14. Participative Efficacy	-.26***	-.16*	-.32***	-.22**	.40***	.38***	-.11	.27***	.30***	.34***	.34***	.45***	.63***			
15. Group Efficacy	-.44***	-.36***	-.30***	-.44***	.38***	.46***	-.29***	.44***	.47***	.45***	.45***	.58***	.72***	.58***		
16. Global Intentions	-.36***	-.24**	-.34***	-.45***	.46***	.56***	-.33***	.42***	.54***	.49***	.47***	.47***	.66***	.52***	.50***	
17. Local Intentions	-.26***	-.16*	-.21**	-.27***	.37***	.40***	-.18*	.32***	.41***	.41***	.37***	.40***	.62***	.69***	.45***	.63***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

Path Model Test

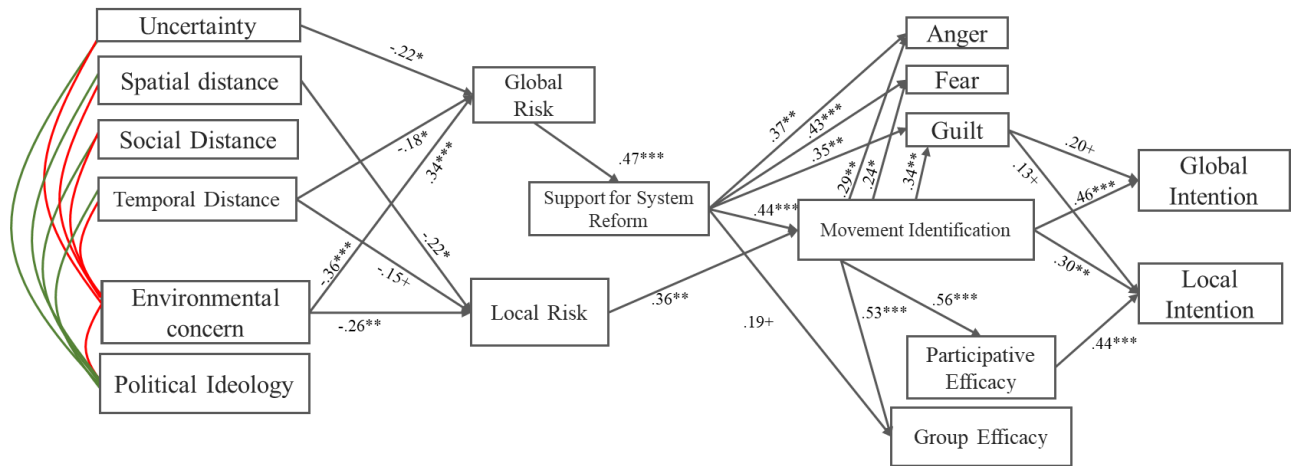
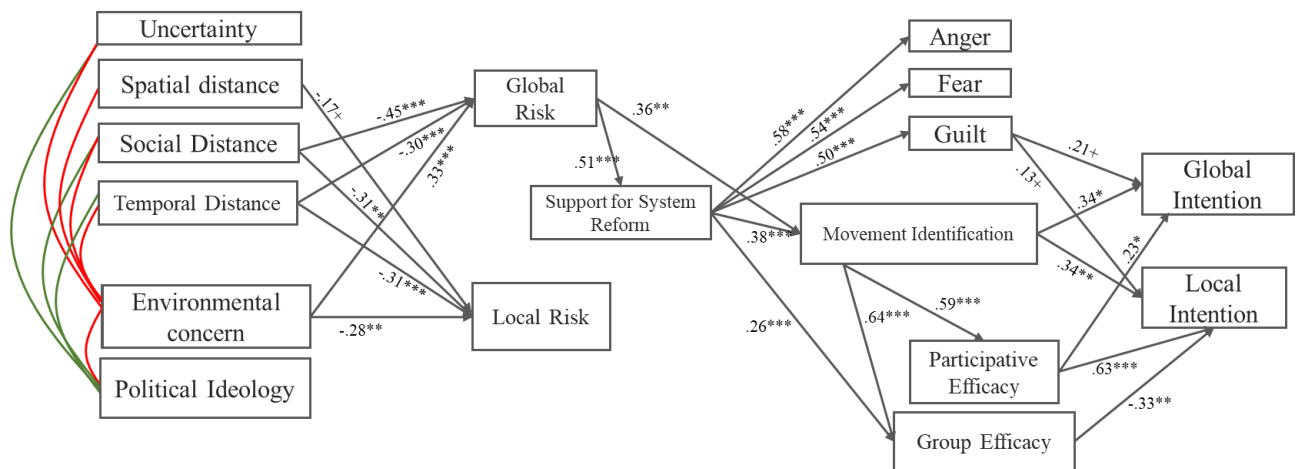
The path model test for the whole sample did not yield a good fit as indicated by fit statistics, based on the criteria by Hu and Bentler (1999) (i.e., $CFI \geq 0.95$, $TLI \geq .95$, $SRMR \leq .80$, $RMSEA \leq .60$). Similar to Studies 1-3, configural invariance was assessed as the next step of the model test to see whether the path model configuration is similar for air pollution and climate change framing. The configural invariance was not confirmed, as indicated by fit statistics ($CFI < .90$, $RMSEA > .10$). Hence, the path models were not found to be comparable across conditions (Milfont & Fischer, 2010). Next, the path models were assessed separately across conditions to examine the configural differences, i.e., the links between variables, across conditions. Model fit indices failed to provide a good fit for both air pollution and climate change condition (see Table 5.4 for the exact fit statistics for the total sample, for configural invariance, and for conditions).

Table 5.4

Fit Statistics of Path Models for Total Sample and Conditions

Model	χ^2	df	CFI	TLI	RMSEA [90% CI]	SRMR	NCI	GH
Total sample	245.087	77	.915	.849	.107 [.092, .122]	.110	.641	.906
Configural Invariance	357.118	154	.899	.822	.118 [.102, .134]	.108	.584	.888
Air pollution (N=93)	182.257	77	.890	.806	.121 [.099, .144]	.117	.564	.882
Climate change (N=97)	174.86	77	.908	.837	.114 [.092, .137]	.111	.601	.894

Notes. CFI = Comparative Fit Index; GH = Gamma Hat; TLI = Tucker-Lewis Index, NCI = Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean-square Residual.

Figure 5.2*Path Model Test for Climate Change Frame***Figure 5.3***Path Model Test for Air Pollution Frame*

To compare path model configuration across conditions, z-values were calculated to see which paths, i.e., standardised regression coefficients and covariances significantly differ across conditions. Firstly, the path differences were computed by subtracting the standardised regression coefficients in climate change model from air pollution model. Secondly, differences between standard errors of coefficients were computed. Then z-scores were calculated with the following formula:

$$z = \frac{b_1 - b_2}{\sqrt{S_{b_1}^2 + S_{b_2}^2}}$$

where b_1 and b_2 are standardised regression coefficients, and S_{b_1} and S_{b_2} are standard deviation for these coefficients, across air pollution and climate. Hence, negative z -values indicate a positive difference between standardised coefficients of air pollution and climate change condition. Table 5.5 presents z -values that were significantly different across conditions (one-tailed).

Based on path model comparisons presented on Figure 5.2 and 5.3, and z -score comparisons, group efficacy was found to predict local intentions in the climate change frame condition but not in the air pollution frame condition. In terms of perceived distances and risk perceptions, uncertainty was a significant predictor of global perceived risk only for or climate change frame, where the difference between paths was marginally significant. Also, the paths from movement identification to anger, fear and guilt were significant for climate change but not air pollution condition, although this difference was marginal for anger and guilt, but nonsignificant for fear. Finally, global risk (vs. local risk) was a predictor of movement identification for air pollution (vs. climate change) frame. Political ideology was strongly linked to spatial, temporal, and hypothetical dimensions of psychological distance within both conditions, but linked to spatial distance only within the climate change condition, as indicated by z -score differences.

Table 5.5

Summary of Path Differences Across Conditions

	z	p
Group Efficacy -> Local Intentions	-1.672	.047
Uncertainty -> Global Risk	1.458	.072
Social Distance -> Global Risk	-2.259	.012
Spatial Distance -> Global Risk	1.486	.069
Global Risk -> Movement Identification	1.785	.040
Local Risk -> Movement Identification	-2.339	.010
Movement Identification -> Guilt	-1.645	.050
Movement Identification -> Anger	-1.545	.061
Spatial Distance <-> Political Ideology	-1.709	.044

Note. The direction of the arrows indicates the causal relationship between the variables.

Table 5.6

Covariances Between Variables for Each Condition

Air Pollution Frame					
	1	2	3	4	5
1 Political Ideology					
2 Environmental Concern	-.40***				
3 Uncertainty	.50***	-.61***			
4 Temporal distance	.30**	-.41**	.31**		
5 Spatial distance	.03	-.43**	.38**	.22**	
6 Social distance	.27*	-.46**	.43***	.30***	.50***

Climate Change Frame					
	1	2	3	4	5
1 Political Ideology					
2 Environmental Concern	-.33**				
3 Uncertainty	.35**	-.56***			
4 Temporal distance	.28**	-.43***	.48***		
5 Spatial distance	.35**	-.40***	.46***	.34**	
6 Social distance	.30**	-.45***	.50***	.43***	.70***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed).

5.6 Discussion

The present study compared the effectiveness of presenting climate change and air pollution frames on environmental activism intentions, psychological distance, and risk perceptions. Although previous studies tested the effect of air pollution framing on pro-environmental policy support, the present study is the first to assess psychological distance

and perceived air pollution explicitly. Also, the present experiment aimed to contribute to the existing literature by examining environmental activism in the context of air pollution, i.e., testing the outcome framing as well as message framing. Finally, the integrated collective action model utilised in previous studies was re-tested in the present study, where the model had the same configuration with Study 3. The following discussion will first consider the reasons for the absence of effects of the frame manipulation, and then assess the inferences to be drawn from the path model tests.

Effects of Framing Condition

In terms of the main effect of framing, the results revealed a nonsignificant difference across air pollution and climate change frames, although perceived uncertainty was higher in the air pollution than in the climate change condition according to individual effect tests. This finding was counterintuitive; however, it should also be interpreted with caution given a nonsignificant multivariate effect of condition on dependent variables, and lack of significance in univariate tests.

Concerning the primary hypotheses of the present study, i.e., relative effectiveness of air pollution framing among conservatives, the findings did not support the interaction between framing and political ideology on any of the dependent variables.

One explanation for the nonsignificant interactions between framing and political ideology may be the slightly positively skewed distribution of political ideology scores in the sample, where the mean score (3.52) was below the midscale of 4, a pattern also observed in Studies 2-3. In other words, since the sample mainly consisted of those with left-wing and moderate political views, it may have limited the scope to observe how extreme conservatives would have responded to air pollution messages. Non-normal distribution of political ideology scores might also account for the absence of main effects of frame, in that liberals

are generally more concerned about environmental issues compared to conservatives, potentially leading to lack of framing effects in the present study (McCright et al., 2013).

The greater perceived uncertainty in air pollution frame could be partly explained by the methodology of the present study. The full uncertainty scale used in Study 3 contained 5 items which addressed each dimension of uncertainty, i.e., trend, impact, and scope uncertainty of climate change impacts. However, in the present study, uncertainty measure was modified to include only scope uncertainty and impact uncertainty, to obtain a scale relevant to both air pollution and climate change. Unlike climate change, whose indicators are imbued with complexity, air pollution can be directly measured and quantified. Hence, it was decided that the measurement of trend uncertainty (i.e., belief in the existence) was irrelevant in the case of air pollution. The decision to exclude trend uncertainty from the uncertainty scale could have decreased perceived uncertainty of climate change in the present study. It could be argued that uncertainty is a more relevant construct to climate change than other environmental problems, which are more concrete, observable and confined to a certain space (e.g., air pollution, ocean acidification). Hence, future studies could design a more valid measure of psychological distance to compare environmental issues by including temporal, spatial and social dimensions and potentially excluding the uncertainty component, due to lesser relevance of uncertainty in the context of more concrete environmental issues such as air pollution.

The present study also failed to find a difference between air pollution and climate change frames in their effects on global and local risk perceptions, and psychological distance except a tentative difference in hypothetical distance. Research shows that air pollution is an environmental hazard impacting a certain locality, and the air quality might change even with nearby cities with different levels of industrial output (Li et al., 2019). On the other hand, climate change is a global environmental crisis with implications such as temperature

changes, ecosystem modification and rising sea levels that impact a much larger area compared to air pollution (Brown et al., 2018; Li et al., 2019; Molotoks et al., 2021; Zaman et al., 2017). Also, air pollution is a more debilitating problem for the developing countries such as Bangladesh and India than for the Western European countries and the UK (Greenpeace, 2019). Therefore, risk perception due to air pollution could be higher and psychological distance from air pollution could be lower in countries with a poorer air quality than the UK. Future studies could employ a cross-cultural design to assess these differences in risk perceptions both at global and local levels. Another important issue is that environmental issues are highly interlinked. Greenhouse gas emissions which lead to climate change and ecosystem modification is also responsible for air pollution, which suggests that presenting air pollution as an entirely different problem may not be a feasible solution (Zaman et al., 2016). However, more research is needed to test whether these links between environmental different environmental issues are also reflected in public perception and knowledge, and to design more successful framing strategies.

The lack of main effects and/or interactions in the present study could also be due to more frequent exposure to climate change related content. Climate change is an issue frequently covered by a range of media outlets, probably due its political significance and seriousness of its impacts. It is also a broader term encompassing various environmental hazards such as ocean acidification, air pollution and species extinction (Brown et al., 2018). Although the prior research identified mentioning other problems as motivating policy support, total exclusion of climate change from the environmental discourse may discredit the scientific evidence regarding climate change and impede activism, implying the need for a more balanced framing (Feldman & Hart, 2018). Hence, it could be argued that alternative framings should only be used when communicating to those with strong right-wing partisan views, or those highly sceptical of climate change to prevent boomerang effects.

The path model tests, although a good fit was not observed, still provided some evidence for the robustness of the certain paths of the model across climate change and air pollution contexts, although there were differences in model configuration. Despite nonsignificant effect of framing on the mean scores of dependent variables, significant differences in path configuration across conditions were observed. This implies a “salience” effect, whereby the issue framing could have caused certain relationships between variables to be emphasised. In terms of homogeneity across conditions, both models had guilt as the sole predictor of local activism among other emotions. Also, paths from support for system reform to collective emotions, group efficacy and movement identification were significant within both conditions. Support for system reform was predicted by global but not local risk across conditions with very similar coefficients, indicating the importance of global risk perceptions in determining support for system reform irrespective of the presented problem. Environmental concern, but not political ideology, appeared as a significant predictor of risk perceptions for both global and local risk perceptions across air pollution and climate change framings.

In terms of the differences between framings, there are some notable patterns to be examined. To begin with, uncertainty was a significant predictor of global risk for climate change but not air pollution. This result is in line with the earlier argument suggesting uncertainty is a particular impediment for climate change mitigation. Paths from global (vs. local) risk to movement identification was significant in the air pollution (vs. climate change) frame. Although this finding is correlational, it could indicate that perceiving greater local risk (vs. global) may be a stronger determinant of action in climate change (vs. air pollution) context. As indicated above, better air quality in the UK could have diminished the salience of local risk. Hence, as per the point made earlier about differences in risk perception across the world, the local risk might be a more determining factor in low air quality areas.

In addition, the link between spatial distance and political ideology was significant in climate change but not air pollution, suggesting stronger link between political orientation and climate change (vs. air pollution) perceptions. Social distance appeared as the strongest predictor of risk perceptions for air pollution, but not for climate change frame which could be due to suppression of the link between social distance and risk perceptions by uncertainty in climate change condition. Finally, the links between emotions and movement identification was much stronger in climate change than in air pollution context, in line with the prominent role of affect in motivating climate action documented in the literature. The path model results should necessarily be interpreted with caution as the sample size was below 100 for each condition, which was not a sufficiently powered for the present model according to required sample size per degrees of freedom (See Chapter 6 for a detailed discussion on sample size considerations). Also, the path model tests did not reveal a satisfactory fit for each condition. However, a large number (26 out of 46) of the hypothesised paths were significant in both conditions, a further 13 (of the remaining 20) paths was significant in one or other condition. Only 7 paths were not significant in either condition, and no paths were significantly contrary to the predicted direction.

Although similar wording was used to reduce the discrepancies between constructs across conditions, it should be noted that different items are used to measure same constructs. For example, activism intentions measure for air pollution condition (vs. climate change condition) focussed on intentions to engage in collective action to combat air pollution (vs. climate change). Hence, the cross-group differences could be attributed to differences in measurement, posing a considerable limitation to the methodology. Therefore, the experimental findings of the present study could be interpreted with caution. Nonetheless, the primary aim of the present study was to explore whether mentioning air pollution was a more potent motivator of activism intentions. Hence, the changes in wording across conditions

were somewhat unavoidable. Future studies could use more general measures of activism without incorporating a specific environmental issue to alleviate this problem.

Conclusion

The present study tested the effectiveness of an alternative issue framing (air pollution) in motivating environmental activism relative to climate change frame. The findings pointed out to a nonsignificant effect of main effect of framing and interaction by political ideology, although the heterogeneity of the measurement across conditions may not warrant a clear comparison. Nonetheless, the exploration of the path model across framings provided notable insights into the differences and similarities between air pollution and climate change perceptions, as well as activism intentions in respective contexts. Emotions, local risk perceptions, and perceived uncertainty were identified as more influential determinants in the climate change than air pollution context, whereas the role of environmental concern, participative efficacy, movement identification and support for system reform was replicated across both frames.

Chapter 6: Discussion

6.1 Introduction

The present thesis has examined the effectiveness of different message framings on environmental activism intentions and assessed the factors driving environmental activism by employing a modified collective action framework. Four online experimental studies were conducted among British nationals. These experiments provided scant evidence that framing effects were moderated by political orientation such that right-wing political orientation was linked to dismissive or defensive attitude towards proximal framing of climate change impacts, which are described as boomerang/backfire effects. These effects were specific to only certain dependent variables and should be considered in the context of other nonsignificant results.

Prior research identified environmental activism as a distinct component of pro-environmental behaviour (Dono et al., 2010). Hence, the present thesis aimed to contribute to frameworks of environmental activism with a novel approach. The theoretical starting point was the Social Identity, Relative Deprivation and Efficacy (SIRDE: Grant et al., 2017) model of collective action, which has previously been tested in the context of social change beliefs and national separatism in Scotland, as well as immigrant assimilation in Canada. Hence, the present thesis is the first to apply the extended SIRDE model to predict environmental activism. Across Studies 1-4, the extended SIRDE model of collective action was tested across different framings of climate change impacts. Although indicating relatively poor model fit, the path model tests showed participative efficacy, i.e., the belief in one's personal impact in contributing positive environmental change, and movement identification, were the most influential and consistent proximal predictors of activism intentions across several framings and that these variables mediated effects of a number of distal predictors. This chapter summarises the key points from the literature review and studies conducted for the

thesis and then considers how far, taken together, the evidence supports hypotheses derived from prior research, and how far it supports the overall path model of environmental activism. It also considers the limitations of the research, its theoretical and applied implications, and directions for future research.

6.2 Summary of the Literature Review and New Empirical Evidence (Chapters 1-5)

6.2.1 Prior Evidence on the Literature Review

The theoretical background for this thesis was examined in two parts. Chapter 1 presented a general summary of individual and collective factors driving pro-environmental engagement, including those examined in the following empirical studies (moral foundations, political ideology, and collective action variables). The individual factors included value orientations, environmental beliefs/concern, moral foundations and responsibility, and political attitudes. The literature has generally revealed that self-transcendental and biospheric values, moral foundations of care and justice, and environmental concern are positively associated with pro-environmental engagement. On the other hand, political attitudes of SDO and RWA, and right-wing political orientation tend to be negatively linked to climate change engagement. Findings concerning the links between these individual factors were also discussed. The key drivers of collective environmental action in the previous literature were examined since the focal outcome of the present thesis is activism intentions. Past research identified activism as a separate category of pro-environmental behaviour, where group-based or collective variables such as social identity, group-based efficacy, and collective emotions come to the fore as the main predictors. The final section of Chapter 1 described several frameworks of environmental activism and laid out the theoretical foundation for the subsequent empirical chapters.

Chapter 2 presented a more detailed analysis of the literature on the effects of psychological distance from climate change because psychological distance is distinguished

as a unique obstacle for climate change mitigation. Dimensions of psychological distance, i.e., hypothetical, temporal, spatial and social distance, were examined within the context of climate change. The review revealed evidence of a positive link between increased distance and decreased climate change engagement were described. Then, distinctions and nuances were addressed, such as the similarities and differences between types of distance, their links to various environmental outcomes, and different implications of correlational compared with experimental findings.

This review established that proximal framings, i.e., reduced distance, are not always effective in changing perceived distance and improving mitigation intentions. Political ideology and prior beliefs were identified as the likely major moderators of distance framing effects. Specifically, right-wing ideology and climate change scepticism were linked to defensive attitudes towards messages highlighting spatially, temporally, and hypothetically proximal climate change impacts. This pattern of responding is referred as a boomerang/backfire effect. In line with this, the evidence revealed biased assimilation of climate change messages, and polarisation of opinions in response to proximal framings. The inconsistent effects of framing in the past literature, are also reflective of methodological heterogeneity across studies.

6.2.2 Empirical Evidence

A central objective of the present research was to identify the most influential variables predicting environmental activism. The empirical parts of the thesis focused on unpacking and exploring possible sources of the variability in prior evidence, in particular the role of key moderators and the overall sets of relationships amongst variables.

For all studies, a dual approach was adopted utilising experimental and correlational analysis simultaneously. The experimental parts tested the impact of different message

framings on environmental engagement, whereas the correlational part entailed testing an integrative model of collective action adapted from the SIRDE model, SIMCA, and VBN framework. Four experimental studies were conducted, involving samples of British nationals recruited online.

Whilst examining different predictors, i.e., psychological distance or moral foundations, and potential moderators, the experiments focussed on a common set of outcomes, i.e., environmental activism intentions.

The second major aim of the present thesis was to test an integrative environmental activism framework across different contexts which was adapted from the SIRDE model. The belief in social change, a key variable in the SIRDE model, was incorporated into the current framework as a more distal predictor of collective action intentions, i.e., as a general “support for system reform”. The conceptual motive for this decision was as follows. Social change beliefs were operationalised as separatist beliefs in the SIRDE model which pertained to a highly specific outcome, i.e., support for Scotland's independence from England (Grant et al., 2017). In the present research, however, climate change engagement was the focal outcome. Climate change encompasses a wide range of interlinked environmental problems. Mitigation of climate change should also include a complex set of behaviours and attitudes that are difficult to narrow down to a specific behaviour, e.g., support for national independence. Hence, the present work modified the level and operationalisation of social change beliefs to refer to a general conviction of the need for a deep-seated reform in the current socioeconomic structure (i.e., support for system reform). It should be noted that although designated as a novel psychological construct in the present work, support for system reform has similar components to system justification, where both constructs pertain to legitimisation/criticism and belief in the fairness of the current socioeconomic order (Jost & Thompson, 2000). However, system justification focuses on legitimisation the societal

inequality concerning the distribution of economic resources and opportunities, whereas support for system reform mainly pertains to endorsement of decentralisation of power with the aim of reducing environmental impacts and promoting sustainability, rather than achieving social equality. Hence, a conceptual distinction between these two constructs seems justified. Thus, departing somewhat from the SIRDE model, this operationalisation justifies locating support for system reform as a pre-cursor to, rather than an outcome of psychological variables that should be more proximal to activism intentions in the causal path model. Nonetheless, in common with the SIRDE model, this social belief structure is considered as a response to appraisals of the current situation, and thus a central organising motivator for engagement in promoting change. Although not pursued in the present research it remains a reasonable proposition that a more specific operationalisation of social change beliefs (oriented towards highly specific environmental movements) could also be applied more proximally to activist intentions. Such a measure would incorporate the ideological viewpoint as well as the belief in the need for a specific transformation or action, e.g., carbon emission regulations. Future studies could test if this variable functions as a proximal predictor of collective action intentions.

Chapter 3 presented the findings of Study 1 which focussed on the role of ingroup and outgroup responsibility of environmental degradation on activism intentions. Study 1 tested whether attributing responsibility for greater greenhouse gas emissions to ingroup vs. outgroup was more effective in motivating intentions to engage in a local environmental movement. The ingroup responsibility manipulation resulted lower endorsement of the care moral foundation and national identification but no difference was observed in terms of activism intentions or other group-based variables. The interaction of framing by national identification on dependent variables could not be tested, which limited the scope of the study. An exploratory mediation analysis revealed a nonsignificant mediation by national

identification between framing and activism intentions, as well as guilt. However, lower harm and justice considerations in ingroup condition hinted to the possibility of moral defensiveness towards ingroup's responsibility. The path model included moral foundations and environmental concern as individual-level predictors and national identification, and sense of community as collective-level predictors. The model did not provide a good fit although regression paths provided evidence on the relationships between variables. In terms of hypotheses, environmental concern was the most influential distal predictor of activism and group-based variables, but the effects of moral foundations and national identification were considerably weaker. This finding led to a decision to drop moral foundations and to replace national identification with political ideology within the model in the subsequent studies.

Chapter 4 described the findings of two experiments. Studies 2 and 3 examined the effectiveness of temporal, spatial and hypothetical distance of climate change where news articles conveying distant vs. proximal impacts of climate change were presented. The findings from both studies provided preliminary evidence concerning the interaction between political ideology and distance framing. In Study 2, proximal temporal framing motivated activism intentions among liberals but was ineffective among conservatives. In Study 3, proximal spatial framing was linked to lower participative efficacy among conservatives but not liberals. Temporally and spatially close framings were either counterproductive or ineffective for improving climate change engagement among politically conservative participants. However, considering no other interaction effect was significant, these findings did not provide consistent evidence supporting "boomerang" or "backfire" effects. In Study 2 and 3, moral foundations were dropped and the path model from Study 1 was modified to include perceived psychological distances from climate change. The results revealed a rather

poor fit of the model, however model invariance was accepted across spatial, temporal, and uncertainty manipulations indicating consistency of the path model across different framings.

Chapter 5 presented the fourth study which was designed to test whether presenting a different environmental problem, i.e., air pollution would be more effective than climate change narrative in reducing psychological distance and motivating environmental activism among conservatives. Although prior research had tested the effects of an air pollution frame, they had not investigated its impact on either psychological distance or environmental activism. It turned out that Study 4 did not confirm expectations from prior research that an air pollution frame would be more effective than a climate change frame in terms of motivating risk perceptions and activism intentions and reducing psychological distance among conservatives. The data did not support the hypothesised moderating role of political orientation on framing effects. The non-normal distribution of political ideology scores was examined as the potential explanation for null findings on framing effects. Measurement discrepancy across conditions could be an alternative explanation for lack of interaction effects.

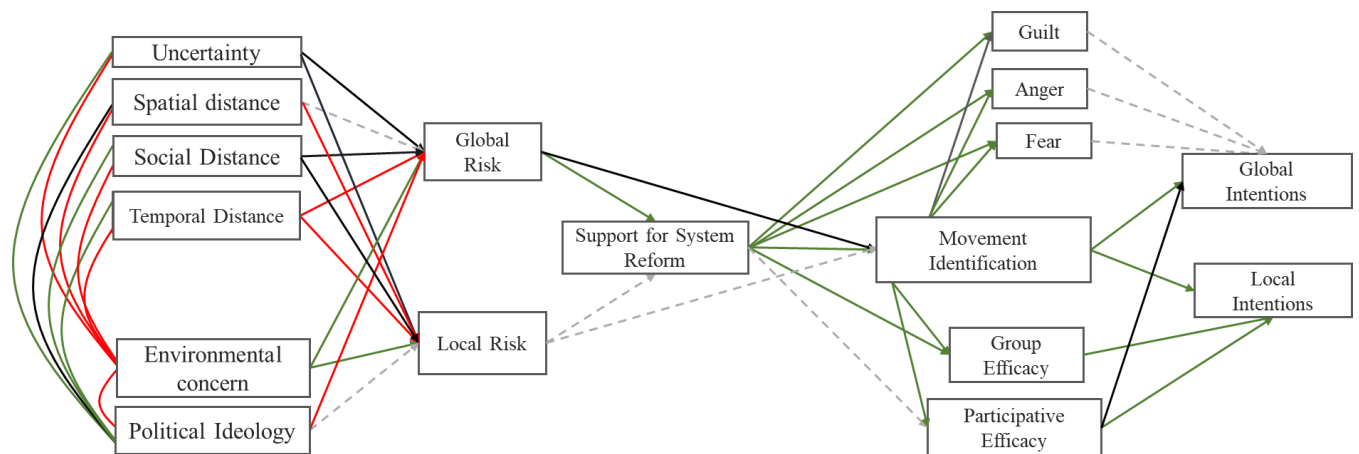
Path Model Comparison Across Studies

In all four studies, an integrated activism framework was employed across different contexts. Fit indices for path model tests did not meet the criteria for good fit for any of the studies. However, the part of the model including collective action variables and support for system reform was consistent across studies. This implied replicability of certain parts of the model. Participative efficacy was the strongest predictor of environmental activism intentions across all studies, whereas the effect of group efficacy was much weaker (Study 3) or nonsignificant (Studies 1, 2 and 4). In addition, environmental concern was also a significant positive determinant of support for system reform or risk perceptions. An important

consistent finding was that support for system reform was a distal predictor of activism intentions, whose effect was fully mediated by collective action variables, mostly participative efficacy beliefs and movement identification. Hence, it can be suggested that support for system reform could be used as a meta-level measure which encapsulates both motivational and instrumental pathways to collective action. Figure 6.1 represents the aggregate findings of the path model tests across Studies 2-4 with a conceptual diagram, which could be a basis for future research to test the replicability and longitudinal stability of the consistent effects, but also the moderators that affect the strength of the inconsistent effects. This summary also provides a ground for the below discussion on the distinctions between frames, e.g., the differential role of each emotion in predicting intentions.

Figure 6.1

Summary of Path Models (Studies 2-4)



Note. Red lines (vs. green lines) indicate negative (vs. positive) relationship between variables. Dotted lines were used for the effects that are weak or inconsistent across studies. Black lines represent effects that were moderated by framing (air pollution vs. climate change).

Collective Emotions

Collective emotions were as not strongly linked to activism intentions as efficacy in the path models, although correlational findings consistently revealed strong relationships between emotions and collective action variables. However, the path models suggest that their effects on activism intentions may be negligible above and beyond those of participative efficacy and movement identification. Despite their weak effects, however, collective emotions could provide some insight into differences between framings. For example, none of the emotions was a significant predictor of activism intentions in Study 1, whereas fear was the only predictor in Studies 2 (marginal) and Study 3. In Study 4, guilt was the only predictor. These differences could be explained by the differences in the experimental treatment across studies. Since the activism intentions were measured as the willingness to

contribute to a local green initiative in Study 1, which do not directly aim for a reparation of the harm done by either group/country, the link between emotions and activism intentions might not have been salient. Also, it should be noted that only group-based anger was measured, which was operationalised as a general expression of anger towards the environmental wrongdoing. Anger towards the ingroup or the outgroup (the UK vs. the US) could have been a more influential predictor of activism intentions. Future studies could focus on anger or other emotions directed at different parties to examine the effect of emotional pathway in greater detail. In Studies 2 and 3, fear was the marginal predictor of intentions. For the experimental manipulations, news articles with dramatic visuals were presented, along with detailed explanation of incoming climate change impacts which could have led fear to be the only prominent emotion linked to activism intentions. Finally, in Study 4, environmental problems were presented only briefly which was followed by the description of Transition Towns movement. Hence, guilt may have been the only predictor due to absence of a responsible target, or lack of imminent danger unlike previous studies. It should be noted that because of the large positive correlations among the collective emotions of fear, anger, and guilt, which are controlled for in the path model, the significant paths from emotions should be interpreted as indicating the more prominent, rather than the only emotion, predicting activism intentions.

It is interesting that, in Study 4, emotions were more strongly linked to movement identification in the air pollution frame than in the climate change frame condition. This implies that emotion-focused coping could play a more prominent role in climate change activism than other contexts. Indeed, media representations and public perception of climate change usually contain dramatic visuals, e.g., melting polar ice caps, flooding, and drought implying the importance of affective imagery in climate change communication (Lehman et al., 2019; O'Neill, 2013). It has also been observed that fear and worry about negative

consequences predict greater pro-climate policy support (Wang et al., 2018). However, the present findings revealed that emotions weakly and inconsistently predicted action intentions when efficacy beliefs were taken into account. Indeed, past evidence also suggests that weak efficacy beliefs limited the motivating power of emotions on climate action. Since the present findings are correlational, it is not possible to reach firm conclusions about the causal impact of emotions in driving activism. Thus, future research could conduct experimental tests of the role of emotional or dramatic appeals in motivating action across the context of climate change and other environmental problems.

Risk Perceptions and Psychological Distance

Across Studies 3 and 4, global risk was found to be a much stronger predictor of support for system reform and movement identification than local risk. Hence, global risk perceptions play a more important role than local risk perceptions in motivating environmental activism. However, local risk still has a potentially important role to play as revealed in its greater role in the climate change (rather than air pollution) condition in Study 4. Arguably, the framing methods of Study 3 made global aspects more salient with presenting news articles with visuals, whereas Study 4 presented only a brief text with a couple of sentences as the framing manipulation. It should also be noted that local and global risk were highly correlated across all studies ($r \sim .80$) which indicate that increased risk perception at one level is likely to impact the other as well.

The present studies also help to provide a comprehensive picture regarding the role of psychological distance dimensions on climate change engagement. Primarily, impact scepticism, i.e., uncertainty about the existence of climate change, was the key determinant, overriding the effect of temporal distance (Study 2). Composite uncertainty also had the largest effect, followed by temporal and spatial distance, whereas the effect of social distance

was negligible (Study 3 and Study 4, climate change model). Interestingly, social distance appeared as the most prominent distal predictor in air pollution frame in Study 4, indicating the dynamic role of distances across environmental issues. Reflecting the relatively high ranking of air quality in the UK compared to other countries across the world, the larger effect of social distance in the air pollution frame implies that air pollution may be perceived to be a “foreign” issue amongst British participants and thus may not engage action in the same way as a climate change frame (Greenpeace, 2019).

The present research also sheds light on different components of climate change scepticism. Impact uncertainty was much less prominent among participants compared to scope uncertainty. Also, impact uncertainty was linked to environmental outcomes and political orientation more strongly than the scope uncertainty. Hence, although prior research has often utilised composite uncertainty measures including belief in climate change as a component, the present findings suggest these components should be separately examined as distinct constructs.

The present work has a number of theoretical and practical implications. Primarily, participative efficacy was the strongest proximal predictor of activism intentions across all studies. Past research indicates that efficacy is the key component in climate change mitigation, which is generally perceived as beyond the individual’s capability (Markowitz & Shariff, 2012). Hence future research could focus on ways to improve participative efficacy through alternative framings. This could directly benefit the campaigning effort of NGOs and politicians to promote pro-environmental behaviour or to convince public to support climate friendly policies. Indeed, the present work revealed that simple distance manipulations were generally effective in changing distance perceptions, they were not always effective in inducing change in pro-environmental engagement (Busse & Menzel, 2014). Future work

could also focus on ways to tackle impediments to efficacy beliefs, such as fatalism, hopelessness, and other individual differences.

Another key theoretical implication relates to the role of political ideology. The present thesis provided inconsistent evidence on political polarisation in response to distance framings. This inconsistency could be due to additional framing characteristics such as how dramatic the impacts are presented, use of visuals, and inclusion of personal stories, which could be a fruitful avenue for future research. As mentioned above, skewed distribution of political ideology in the samples and lesser political relevance of environmental issues in the UK compared to the US could be responsible for the inconsistent boomerang effects. Thus, it is crucial to replicate framing studies across cultures and countries to obtain a more comprehensive understanding of the role of political ideology on climate change opinion polarisation. In addition, the present study used a 1-item political ideology measure. Arguably, a more fine-tuned or detailed measurement of political ideology could offer a more complete picture. Hence, future studies could examine whether different dimensions of political beliefs such as system justification RWA and SDO are potential moderators of distance framing effects.

Another key implication from the present thesis was that certain dimensions of climate change uncertainty (i.e., scope uncertainty) appear to be more malleable than others (i.e., impact uncertainty). However, impact uncertainty is more closely related to collective action variables and political ideology. Hence, messages that focus on modifying impact uncertainty by trying to convince sceptics could not only be ineffective, but also backfire through mechanisms of motivated denial (Whitmarsh, 2011).

6.3 Limitations and Future Research

Before concluding, some methodological limitations associated with the present research must be considered. The main hypotheses for all studies included moderation of framing effects by political ideology. The findings of the present study found only partial support for the role of political ideology as a moderator of climate change impact framings. There was some, but inconsistent evidence indicating dismissiveness (Study 2) and boomerang effects (Study 3) among conservatives in response to close temporal and spatial framing. However, the sample characteristics revealed skewed distributions of political orientation scores, where most of the participants expressed moderate or left-wing political views. For this reason, the moderation tests may not have detected a significant interaction involving political orientation due to an insufficient proportion of participants at the far-right end of the political ideology scale.

A further limitation is that the samples recruited for all studies in this research were British nationals. Prior research that revealed boomerang effects among conservatives has mostly involved American samples (Hart & Nisbet, 2012; Ma et al., 2019; Zhou, 2016). Thus, failure to replicate the past findings on boomerang effect in the present studies may be attributed to the nationality of the recruited sample. Indeed, beliefs and attitudes towards climate change are positively related to neoliberal economic views, and party affiliation mostly in the English-speaking countries, and predominantly in the USA. However, ideological connotations of climate change was less strong among Western European and much weaker for post-communist countries (Smith & Mayer, 2019). Hence, climate change and other environmental issues appear to carry a greater and more unidimensional (Democrat vs Republican) political significance in the USA than in other countries (Dalton, 2006). Similarly, although national identification was positively linked to climate change denial among American participants (Feygina et al., 2010), for some countries, e.g., New Zealand,

environmentalism is perceived as an essential component of national identity (Milfont et al., 2020). Hence, more research is needed to clarify the cross-country differences concerning boomerang effects in climate change communication.

It was also not very feasible to test boomerang effects among climate change sceptics in the present research because levels of impact scepticism and trend scepticism were quite low across all samples. This could be explained by greater prevalence of scepticism generally in America compared with Britain. This idea is supported by prior research showing that the representation of climate change differed across the UK and the US, such that the ratio of climate-sceptical news to the total number of climate change related news was lower in the UK newspapers than that of the US (Painter & Ashe, 2012). Future studies could illuminate whether media representation of climate change reflects public opinion in these two countries.

Also, in Study 1, a manipulation check of responsibility framing was not included into the measures. Therefore, it was not possible to detect whether participants accepted or rejected individual responsibility, deflected responsibility to other agents, (industry, government, etc.) to other ingroup members, or towards a specific outgroup. Measuring perceived responsibility could have provided interesting insights into what the increase in harm and care foundations, and national identification in response to outgroup responsibility scenario, primarily among high identifiers. In addition, ingroup glorification could be examined as a separate moderator of framing effects, which was positively linked to moral disengagement from ingroup misdeeds (Castano, 2008).

In Studies 2 and 3, psychological distance manipulations were achieved using news articles. However, it is likely that prior exposure to climate change related news could have impacted the effectiveness of experimental manipulation through biased assimilation (Garrett

et al., 2016). Hence, climate change news exposure, and preferred news outlets could have been incorporated into the study as potential moderators of distance framing effects.

Studies 2 and 3 also omitted some variables that past research had identified as potential moderators of distance framing as well as predictors of perceived distance. For example, personal experience of extreme weather events (e.g., flooding, severe heat wave) was found to predict higher risk perception and, in turn, more negative affect (Van Der Linden, 2014). Similarly, a correlational study found that people who lived closer to the coastline in New Zealand (hence more likely to personally experience sea-level rise and flooding) expressed greater beliefs in climate change impacts and greater agreement that carbon emissions should be limited by the government (Milfont et al., 2014). Hence, personal experience of climate change impacts could enhance the impact of proximal messaging and increase issue relevance. One thing to note is that personal experiences of extreme weather events should be clearly attributed to climate change to influence people's concern and willingness to take action. For example, in one study, the experience of climate change impacts predicted pro-environmental intentions only when participants acknowledged that these events were imputable to climate change (Brügger et al., 2015).

An additional variable that needs consideration is message characteristics. Messages related to climate change are not only defined by the psychological distance they highlight, but also other aspects such as their factual/judgmental tone, appeal to morality and values, and more generally positive/negative framing. Past research showed that positive/negative framing of the message can moderate the effect of psychological distance, more specifically that of hypothetical distance (Morton et al., 2011). When the messages conveyed high uncertainty, positive framing of mitigation outcomes led to higher intentions to adopt pro-environmental behaviour than a negative framing. Another study by White et al. (2011) revealed that construal level moderates the impact of positive (vs. negative) framing on pro-

environmental behaviour. Hence, future studies may need to examine different message characteristics along with distance framing.

An additional methodological limitation is related to measurement of dependent variables in Study 4. In the air pollution frame condition, the measures of risk perception, efficacy, activism intentions, and psychological distance were adapted from Study 3, in which they were used in the context of climate change. However, these adapted versions were not tested and validated by previous research. It could be the case that simply changing the frame to air pollution from climate change may not have addressed the relevant psychological construct. For example, psychological distance is mostly an obstacle for climate change mitigation, where certain dimensions, i.e., uncertainty, may not be equally useful in understanding attitudes towards air pollution. Air pollution is a more concrete and quantifiable issue than climate change. Hence, simply comparing perceived distances for climate change and air pollution may not provide insight into the perception of these problems in general. Equivalence could be less of a problem with risk perceptions and action intentions. Moreover, local vs. global risk distinction in the context of climate change is not equally relevant to air pollution, as the latter is a more localised issue than the former (see Chapter 5 for a more detailed discussion).

A more general methodological limitation of the present thesis relates to the measurement of activism intentions throughout studies. Specifically, recent studies focussed on normative collective action, e.g., participation in a local grassroots environmental movement and petition signing. Including other examples of activism such as non-normative collective action could have modified the results. For example, prior research has showed that normative and non-normative collective action have distinct antecedents, where the former was predicted mostly by anger and the latter by contempt (Becker & Tausch, 2015). There are several movements which engaged in disruptive actions to draw public attention to the

climate crisis, such as Extinction Rebellion (XR), whose protests and road blockades led to clashes with the police (BBC News, 2019). Anger was found to be a significant predictor of XR activism among current activists (Furlong & Vignoles, 2021). Future studies could examine whether other emotions, such as contempt, are also a determinant of climate activism. In addition, boomerang effects among conservatives could also be explored in response to normative and non-normative action groups. Arguably, non-normative climate action could result in greater backlash among those with conservative political attitudes, due to attempted disruption of status quo. In addition to non-normative action, more examples could have been included into the measures to ensure generalisability of the results.

Although past research and present studies focused on alternative framing to reduce political polarisation, news sources and self-selection bias should be considered as potential impediments to a framing intervention. Indeed, in a recent study, selective exposure to certain media outlets was found to deepen the climate change opinion gap between liberals and conservatives political divide among American participants. Specifically, conservative political orientation was positively linked to preference of media outlets, e.g., Fox News, which predicted lower belief in human caused climate change (Bolin & Hamilton, 2018). Hence, to prevent increased polarisation, climate change could be communicated through organisations and agents that are perceived as relatively neutral by the public in terms of their political stance.

Also, the main outcome variable of the present thesis was activism intentions, but not the actual behaviour. A meta-analytic study revealed that although the correlational relationship between behavioural intentions and behaviour is strong, experimental findings point out to a much weaker effect of intention manipulations on behavioural outcomes (Webb & Sheeran, 2006). Therefore, future studies should focus on the actual behaviour in the activism domain, e.g., by including petition signing or donation as the outcome variables.

A more general methodological limitation is linked to application of multivariate analysis of variance (MANOVA) to the present studies. Although the data met certain assumptions of MANOVA, e.g., equal number of cases across groups and independent observations, and continuous outcome variables; multivariate normality was not achieved, which could have led to incorrect results or inflation of Type 1 errors concerning univariate effects of experimental treatment (Baguley, 2012). In addition, MANOVA computes a composite dependent variable to compare across conditions, rather than individual outcomes. Therefore, although MANOVA was deemed as the most appropriate statistical test to compare differences across groups, the reliability of the test results could be improved with the use of other techniques such as multivariate regression (Huang, 2020).

In terms of the path model, future studies could incorporate other attitudes and beliefs into the integrated SIRDE model presented in this thesis. Primarily, research indicated that apathy and issue fatigue are potential obstacles to climate change activism (Morrison et al., 2018). Similarly, fatalism, i.e., belief that it is too late to mitigate climate change impacts, was negatively linked to pro-climate policy support (Mayer & Smith, 2019). Hence, these beliefs could be examined as linked to psychological distance from climate change as potential determinants of climate activism.

Secondly, although the conceptual background was provided for the causal sequence of the path model variables across studies (e.g., from more general or temporally stable variables to a more specific or concrete outcomes), causal inference cannot be confidently drawn due to the cross-sectional design. Hence, longitudinal designs or experimental studies are needed to eliminate the possibility of reverse-causality and confirm directions of the regression paths presented in the model. Nonetheless, this may be mostly needed for the novel components, e.g., paths from moral foundations to support for system reform, upon the well-established parts of the model, i.e., the links between collective action variables which

were confirmed across a number of studies (Barth et al., 2015; van Zomeren et al., 2008, 2012).

Finally, the sample sizes for Studies 1-3 were around 200, recommended minimum for SEM analyses. However, rules of thumb in sample size determination are difficult to ascertain and often ambiguous or contradictory for determining the relevant N in relation to model characteristics, e.g., number of free parameters (Boomsma, 2001). For example, Kline (2011) suggested that the sample size should be at least 5 or 10 times of the free parameters in the path model. The number of free parameters in Study 3 was 62 and 92 in Study 1, which would imply minimum samples of 310 and 460 respectively. Yet the practicalities and budget constraints of research required recruitment of a smaller number of participants were recruited for Studies 1-3, possibly leading to loss of power in detecting certain effects in the path model. Instead, inferences about the robustness of the model and conclusions drawn from it have to rely more strongly on the replicability of pathways across studies, as well as from the effect sizes observed within the studies. It will be for future studies to replicate the models with larger and higher-powered samples.

6.4 Conclusion

Global environmental problems such as climate change require concerted action and collective effort by multiple agents (Ostrom, 2010). Although past literature on framing climate change impacts had examined how to motivate private sphere pro-environmental behaviour and green policy support, they had not examined effectiveness of different messages on motivating environmental collective action and grassroots activism. Thus, the present thesis aimed to explore the antecedents of collective climate action and effectiveness of different framings of climate change impacts in motivating environmental activism.

Primarily, the findings of the present thesis provided partial evidence that among British citizens framing effects could be moderated by personal views, i.e., political orientation and national identification. Specifically, some of the findings indicated that those with right-wing political orientation were dismissive or defensive towards news articles highlighting proximate impacts of climate change.

Despite being inconsistent across dependent variables and frames, these findings could inform politicians and campaigners by presenting some guidelines on using climate change messages effectively to promote action or policy support among citizens. Public climate change perception is influenced by media presentations and climate change beliefs carry political significance; hence framing techniques will need to be used dynamically. The present findings could not fully support past research on the effectiveness of air pollution framing on ameliorating political polarisation. This might be due to sample characteristics. However, despite increased belief in serious impacts and personal experience of climate change, issue fatigue could emerge, which then decrease motivation to pursue climate friendly action (Morrison et al., 2018). In short, political authorities and campaigners could opt for a mixed approach to promoting pro-environmental actions, primarily focussing on climate change. In general, relying less on moralising or politicising narratives could prevent defensiveness. Emphasising the importance of individual contribution and promoting behaviours that are achievable could improve participative efficacy, which might then contribute activism participation.

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APPENDIX A: Materials and Measures

Study 1

Experimental Manipulation

1. Ingroup responsibility condition

Globally, the United Kingdom is among the top 5 countries with the largest carbon footprint per capita, affecting the rest of the world substantially. This is largely due to human decisions, norms, and behaviour, by both individuals and organisations. Nowadays there are increasing numbers of media reports about serious environmental damage caused by human activity, much of which has potentially devastating consequences for the planet and for all natural life, including human life. Experts agree that air pollution from cars, consumption of fossil energy, and pollution from industrial and domestic waste, as well as large-scale dumps and incinerators, are creating some of the most pressing environmental problems of our time. The United Kingdom's impact on carbon emissions is the responsibility of everyone living in the UK.

2. Outgroup responsibility condition

Globally, the United States is among the top 5 countries with the largest carbon footprint per capita, affecting the rest of the world substantially. This is largely due to human decisions, norms, and behaviour, by both individuals and organisations. Nowadays there are increasing numbers of media reports about serious environmental damage caused by human activity, much of which has potentially devastating consequences for the planet and for all natural life, including human life. Experts agree that air pollution from cars, consumption of fossil energy, and pollution from industrial and domestic waste, as well as large-scale dumps and incinerators, are creating some of the most pressing environmental problems of our time. The

United States' impact on carbon emissions is the responsibility of everyone living in the United States.

TT introduction (both conditions)

There are some initiatives that address environmental problems by building local energy autonomy. A prominent example of emerging community-based collective action initiatives is the Transition Towns (TT) movement. It aims at mobilizing community action and fostering public empowerment and engagement around climate change, with the objective of bringing about a transition to a low-carbon economy. TT initiatives pursue many locally based activities which aim to reconfigure social practices around energy consumption, for example establishing locally owned renewable energy companies, promoting locally-grown food, encouraging energy conservation, exemplifying low-carbon living, and building supportive communities around these.

Environmental Concern

The following questions ask about your views on environmental issues. Please read the questions and give your answer to each one without spending too much time on any one question.

1. We are approaching the limit of the number of people the earth can support.
2. The earth is like a spaceship with very limited room and resources.
3. Humans have the right to modify the natural environment to suit their needs.
4. Humans are severely abusing the environment.
5. Humans were meant to rule over the rest of nature.
6. If things continue on their present course, we will soon experience a major ecological catastrophe.
7. Human ingenuity will ensure that we do NOT make the earth unlivable.

8. Humans will eventually learn enough about how nature works to be able to control it.

Movement Identification

Now we would like to ask about your views on Transition Towns movement. Please read the questions and give your answer to each one without spending too much time on any one question.

1. I see myself as similar to people who are in the Transition Towns movement.
2. I would not mind if someone thought I belonged to the Transition Towns movement.
3. I identify with the Transition Towns movement.
4. I probably share the same values and attitudes as people who belong to the Transition Towns movement.
5. I feel connected with activists of the Transition Towns movement.
6. I would be proud to be a member of the Transition Towns movement.

Efficacy Beliefs

Now we would like to ask about your views on Transition Towns movement. Please read the questions and give your answer to each one without spending too much time on any one question.

1. Through joint actions, Transition Towns groups could effectively contribute to local climate protection.
2. Transition Towns groups could make an effective contribution to local climate protection.
3. My active collaboration would be a significant contribution for a local Transition Towns group to reach its goals through joint actions.

4. With my active collaboration I would make a significant contribution that a Transition Towns group could work effectively for local climate protection.
5. I think it would be easy for me to take part in local Transition Towns activities.
6. I have enough time and resources to work for Transition Towns initiatives if I wanted to.

Activism Intentions

Now we would like to ask about your intentions regarding Transition Towns movement.

Please read the questions and give your answer to each one without spending too much time on any one question.

1. I intend to work in local Transition Towns initiative projects.
2. I plan to take part in of Transition Towns activities in my neighbourhood.
3. I expect that I will be able to attend Transition Towns meetings and activities in the future.

Sense of Community

Now we would like to ask your opinions related to your neighborhood. Please read the questions and give your answer to each one without spending too much time on any one question.

1. The fact that I am a member of my neighbourhood/community is an important part of my identity
2. I feel committed to my neighborhood/community.
3. The members of my neighborhood/community come from similar backgrounds.
4. The members of my neighborhood/community have the same opinions.
5. The members of my neighborhood/community have similar personalities.
6. I depend on other neighborhood/community members for support.

7. I am generally willing to give help or support if others in my neighbourhood or community ask for it.
8. I am aware of people in my neighbourhood who would like to involve me in activities or things that involve the whole neighbourhood.

National Identification

In this part, we would like to ask for your opinions related to Britain. Please read the questions and give your answer to each one without spending too much time on any one question.

1. I identify with British people.
2. I feel strong ties with Britain.
3. I am proud to be British.
4. I regard myself as typically British.

Moral Foundations

In this part of the survey, you will be answering some questions related to your perceptions of society and feelings related to environmental issues. Please read the questions and give your answer to each one without spending too much time on any one question.

Care

1. Compassion for those who are suffering is the most crucial virtue.
2. One of the worst things a person could do is hurt a defenseless animal.

Justice

1. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
2. Justice is the most important requirement for a society.

Loyalty

1. I am proud of my country's history.
2. People should be loyal to their family members, even when they have done something wrong.

Authority

1. Respect for authority is something all children need to learn.
2. Men and women each have different roles to play in society.

Purity

1. People should not do things that are disgusting, even if no one is harmed.
2. I would call some acts wrong on the grounds that they are unnatural.

Emotions

In this part, you will be answering general questions about the environmental issues. Please read the questions and give your answer to each one without spending too much time on any one question.

1. I feel guilty about how we humans are treating the environment.
2. I feel angry when I think the way we humans are using environmental resources.
3. I am fearful of the negative future consequences of the climate change.

Support for System Reform

1. There will need to be a power shift towards local people to enable environmental initiatives such as Transition Towns to succeed.
2. In order to have a sustainable future, we need to have a significant shift in political power to give local people more control.
3. A shared effort among whole communities in matters such as recycling and energy conservation will be needed to reverse the adverse effects of global warming.
4. To address environmental problems we need significant reformation of political systems and priorities to put the environmental issues first.

Attention Check

According to the information given in the text at the beginning of the survey, which of the below statements is correct?

- United Kingdom has one of the highest carbon footprint per capita as a country.
- United States has one of the highest carbon footprint per capita as a country.
- Germany has one of the highest carbon footprint per capita as a country.

Study 2

Political Ideology

In terms of political orientation, where would you place yourself on the scale below?

1. 1 = Extremely left, 7 = Extremely right

Uncertainty (Hypothetical Distance)

Please rate your agreement with the following statements.

1. I am confident that climate change will pose a serious threat to the natural life in the future (R).
2. It is uncertain what the effects of climate change will be.

Temporal Distance

In your opinion, when will we begin to experience the most serious impacts of climate change?

2020

2120



Attention Checks

1. Uncertainty

According to the newspaper article, to what degree of accuracy can scientists predict climate change impacts?

- Low
- Medium
- High

2. Temporal Distance

In terms of the impacts of climate change in the UK, what is the time period that is most frequently mentioned in the article?

- 2030s
- 2070s
- 2120s

3. News Content

Which of the below is not mentioned in the newspaper article you read at the beginning of the survey?

- Heatwaves in the UK
- Floods and problems with water supplies in the UK
- Extinction of local species in the UK

Activism Intentions


Now we would like to ask about your intentions regarding Transition Towns movement.

Please read the questions and give your answer to each one without spending too much time on any one question.

1. I intend to work in local Transition Towns initiative projects.
2. I plan to take part in of Transition Towns activities in my neighbourhood.
3. I expect that I will be able to attend Transition Towns meetings and activities in the future.
4. I would be willing to sign a petition to push UK political parties to enforce legislation that would help mitigate climate change.
5. I intend to join a protest to force UK politicians to take necessary actions to lower carbon emissions and prevent more environmental degradation.

Experimental Manipulations

1. Low Uncertainty Low Temporal Distance Condition

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Reuters Focus: Climate Change

Climate Catastrophe on the Way: 2030 Outcomes for the UK

Recent research on climate change highlights different dimensions of serious risk for the UK over the next 20 years. Statistics identified that temperatures in the UK have risen by about one degree since the 1970s and, given the levels of greenhouse gas already present in the atmosphere, further warming is inevitable over the next decades.

The amount of warming will depend on future emissions but even if emissions are cut quickly and sharply, there will be some unavoidable impacts that the UK will have to adapt to. Researchers note that the disastrous scenario could not be avoided even if countries meet their commitments to keep temperatures from rising more than 2° C by 2100, a goal embedded in the 2015 Paris Agreement on climate change, instead we should aim to limit temperature rise to 1.5° C.

The UK government's latest climate change risk assessment identifies flood risk as one of the key climate threats for the UK alongside stresses on water resources, threats to biodiversity and natural habitats. Computer simulations suggest that, as a result of warming, extremely wet winters will become five times more likely over the next 20 years, with more intense downpours in the winter months driving a greater risk of flooding.

Extreme flood events such as those in the summer of 2007 will become more frequent and severe in the UK putting homes, businesses and infrastructure at greater risk. The UK government also estimates that annual damages from flooding alone will increase about 10 times compared with current-day estimates by the year 2030.

Conversely, the models suggest that the UK will experience warmer, drier summers in the future. While that may bring some benefits, it could mean increased risk of drought, and extreme events such as the 2003 in the UK heat wave are most likely to be the norm in the near future. Heatwaves could also heighten pressure on healthcare services and transport.

For example, UK experienced severe heatwaves from 25 June to 9 July of 2018, according to the Met Office, a run of 15 consecutive days with temperatures above 28° C. The deaths registered during the weeks covering this period were 66 times higher than the average for the same weeks over the previous five years, as data from the Office of National Statistics shows. Without further action it is almost certain that heat-related deaths will triple to 7,000 in a year in 10 years.

In the face of global warming UK will also face threats to its water security and supply due to declining summer river flows, reduced groundwater replenishment and increased evaporation. IPCC estimates that 59 million people could be living in areas affected by water supply deficits within our lifetime, even before considering increasing populations and rising water demand.

With extensive modelling, regional climate change effects can be predicted and simulated with a high degree of accuracy. Based on these results, climate policy to cut global greenhouse gas emissions may only have a negligible effect on future climate impacts.

These model predictions are based on a number of calculations about factors ranging from future rates of warming and economic growth to the technological and social achievability of different levels of emissions cuts.

Most of these predictions have high certainty in the sense that climate scientists mostly agree on the extent of the risk posed by climate change and the range of impacts, although wider social and economic trends will also affect the UK's vulnerability to the effects of climate change.

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2. High Uncertainty Low Temporal Distance Condition

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The amount of warming will depend on future emissions but even if emissions are cut quickly and sharply, there will be some unavoidable impacts that the UK will have to adapt to. Researchers note that the disastrous scenario could not be avoided even if countries meet their commitments to keep temperatures from rising more than 2° C by 2100, a goal embedded in the 2015 Paris Agreement on climate change, instead we should aim to limit temperature rise to 1.5° C.

The UK government's latest climate change risk assessment identifies flood risk as one of the key climate threats for the UK alongside stresses on water resources, threats to biodiversity and natural habitats. Computer simulations suggest that, as a result of warming, extremely wet winters could become five times more likely over the next 20 years, with more intense downpours in the winter months driving a greater risk of flooding.

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However, with these types of modelling and assumptions the hypothetical effects can only be simulated only to a certain level of accuracy. These model predictions are based on a number of assumptions about factors ranging from future rates of warming and economic growth to the technological and social achievability of different levels of emissions cuts.

Therefore, climate policies to cut global greenhouse gas emissions may have a tangible effect on future climate impacts, offering governments a way to avoid the most impacts of climate change.

In terms of the certainty of these predictions, climate scientists haven't reached a total agreement on the extent of the risk posed by climate change and the range of impacts, although wider social and economic trends will also affect the UK's vulnerability to the effects of climate change. Therefore, it remains quite uncertain how large these effects might be.

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Reuters Focus: Climate Change

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Recent research on climate change highlights different dimensions of serious risk for the UK over the next 100 years. Statistics identified that temperatures in the UK have risen by about one degree since the 1970s and, given the levels of greenhouse gas already present in the atmosphere, further warming is inevitable over the next century.

The amount of warming will depend on future emissions but even if emissions are cut quickly and sharply, there will be some unavoidable impacts that the UK will have to adapt to. Researchers note that the disastrous scenario could not be avoided even if countries meet their commitments to keep temperatures from rising more than 2° C by 2100, a goal embedded in the 2015 Paris Agreement on climate change, instead we should aim to limit temperature rise to 1.5° C.

The UK government's latest climate change risk assessment identifies flood risk as one of the key climate threats for the UK alongside stresses on water resources, threats to biodiversity and natural habitats. Computer simulations suggest that, as a result of warming, extremely wet winters will become five times more likely over the next 100 years, with more intense downpours in the winter months driving a greater risk of flooding.

Extreme flood events such as those in the summer of 2007 will become more frequent and severe in the UK putting homes, businesses and infrastructure at greater risk. The UK government also estimates that annual damages from flooding alone will increase about 10 times compared with current-day estimates by the year 2120.

Conversely, the models suggest that the UK could experience warmer, drier summers in the future. While that may bring some benefits, it could mean increased risk of drought, and extreme events such as the 2003 in the UK heat wave are most likely to be the norm eventually. Heatwaves could also heighten pressure on healthcare services and transport.

For example, UK experienced severe heatwaves from 25 June to 9 July of 2018, according to the Met Office, a run of 15 consecutive days with temperatures above 28° C. The deaths registered during the weeks covering this period were 66 times higher than the average for the same weeks over the previous five years, as data from the Office of National Statistics shows. Without further action it is almost certain that heat-related deaths will triple to 7,000 in a year in 100 years.

In the face of global warming UK will also face threats to its water security and supply due to declining summer river flows, reduced groundwater replenishment and increased evaporation. IPCC estimates that 59 million people could be living in areas affected by water supply deficits for people in future generations, even before considering increasing populations and rising water demand.

With extensive modelling, regional climate change effects can be predicted and simulated with a high degree of accuracy. Based on these results, climate policy to cut global greenhouse gas emissions may only have a negligible effect on future climate impacts.

These model predictions are based on a number of calculations about factors ranging from future rates of warming and economic growth to the technological and social achievability of different levels of emissions cuts.

Most of these predictions have high certainty in the sense that climate scientists mostly agree on the extent of the risk posed by climate change and the range of impacts, although wider social and economic trends will also affect the UK's vulnerability to the effects of climate change.

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4. High Uncertainty High Temporal Distance Condition

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Reuters Focus: Climate Change

Climate Catastrophe on the Way: 2120 Outcomes for the UK

Recent research on climate change highlights different dimensions of serious risk for the UK over the next 100 years. Statistics identified that temperatures in the UK have risen by about one degree since the 1970s and, given the levels of greenhouse gas already present in the atmosphere, further warming is inevitable over the next century.

The amount of warming will depend on future emissions but even if emissions are cut quickly and sharply, there will be some unavoidable impacts that the UK will have to adapt to. Researchers note that the disastrous scenario could not be avoided even if countries meet their commitments to keep temperatures from rising more than 2° C by 2100, a goal embedded in the 2015 Paris Agreement on climate change, instead we should aim to limit temperature rise to 1.5° C.

The UK government's latest climate change risk assessment identifies flood risk as one of the key climate threats for the UK alongside stresses on water resources, threats to biodiversity and natural habitats. Computer simulations suggest that, as a result of warming, extremely wet winters could become five times more likely over the next 100 years, with more intense downpours in the winter months driving a greater risk of flooding.

Extreme flood events such as those in the summer of 2007 could become more frequent and severe in the UK putting homes, businesses and infrastructure at greater risk. The UK government also estimates that annual damages from flooding alone could increase about 10 times compared with current-day estimates by the year 2120.

Conversely, the models suggest that the UK could experience warmer, drier summers in the future. While that may bring some benefits, it could mean increased risk of drought, and extreme events such as the 2003 in the UK heat wave could be the norm eventually. Heatwaves could also heighten pressure on healthcare services and transport.

For example, UK experienced severe heatwaves from 25 June to 9 July of 2018, according to the Met Office, a run of 15 consecutive days with temperatures above 28° C. The deaths registered during the weeks covering this period were 66 times higher than the average for the same weeks over the previous five years, as data from the Office of National Statistics shows. Without further action heat-related deaths may triple to 7,000 in 100 years.

In the face of global warming UK could also face threats to its water security and supply due to declining summer river flows, reduced groundwater replenishment and increased evaporation. IPCC estimates that 59 million people could be living in areas affected by water supply deficits for people in future generations, even before considering increasing populations and rising water demand.

However, with these types of modelling and assumptions the hypothetical effects can only be simulated only to a certain level of accuracy. These model predictions are based on a number of assumptions about factors ranging from future rates of warming and economic growth to the technological and social achievability of different levels of emissions cuts.

Therefore, climate policies to cut global greenhouse gas emissions may have a tangible effect on future climate impacts, offering governments a way to avoid the most impacts of climate change.

In terms of the certainty of these predictions, climate scientists haven't reached a total agreement on the extent of the risk posed by climate change and the range of impacts, although wider social and economic trends will also affect the UK's vulnerability to the effects of climate change. Therefore, it remains quite uncertain how large these effects might be.

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Study 3

Uncertainty (Hypothetical Distance)

Please rate your disagreement/agreement with the following statements.

1. I am uncertain that climate change is really happening.
2. The seriousness of climate change is exaggerated.
3. Most scientists agree that humans are causing climate change (R).
4. It is uncertain what the effects of climate change will be.
5. Climate change is due to natural fluctuations in temperatures rather than human activity.

Social Distance

Please rate your disagreement/agreement with the following statements.

1. Climate change will mostly affect developing countries.
2. Climate change is likely to have a big impact on people like me (R).
3. Countries like my own will experience serious impacts of climate change (R).

Spatial Distance

Please rate your disagreement/agreement with the following statements.

1. My local area is likely to be affected by climate change (R).
2. Climate change will mostly affect areas that are far away from here.

Climate Change Risk Perceptions

1. Global Risk

How likely do you think following events would occur due to climate change in the next 50 years?

1. Worldwide water shortages will occur.
2. People's standard of living would decrease worldwide.

3. Climate change will be a significant threat for the people all around the world.

2. Local Risk

1. Severe water shortages will occur where I live.
2. My standard of living will decrease substantially.
3. Climate change will significantly affect me and my family.

Attention Check: News Content

What was the focus of the newspaper article at the beginning of the survey? Please explain with one or two sentences.

Experimental Manipulations

1.High Distance (Global) Condition

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CLIMATE CHANGE FOCUS

Overview of Impacts for the World

‘Climate change’ refers to changes in the Earth’s temperature and other climate-related phenomena (e.g., rainfalls, wind, humidity) since the industrial revolution. Average global temperatures have risen by about 1°C between 1900 and 2010. It is important to note that changes in average temperatures are associated with other global climatic changes. For instance, in many places around the world summers have already become hotter and drier.

What are the consequences of climate changes for the world?

Experts expect that average global temperatures could rise further between 1°C and 8°C in the following years. Such temperature rises will have drastic impacts on humans, animals, and plants.


Most scientists attribute recent climate change to human behaviour rather than natural causes, especially to greenhouse gas emissions (i.e., carbon dioxide, methane), which artificially warm the earth’s atmosphere. A substantial proportion of these emissions are caused by deforestation and burning fossil fuels such as oil and coal to produce food, heat buildings, and drive cars.

- Hot and dry summers will become much more frequent. The effects of heat-waves will not only be experienced in large cities like New York, Delhi, or Tokyo, where buildings and streets absorb and radiate the energy from the sun, but also in small villages. Droughts and water scarcity will occur more regularly, especially in the Central America, Southern Africa, and Southeast Asia. Climate change will significantly decrease agricultural yields. For example, yield of wheat (rice) could decrease by up to 5% across Southeast Asia.


- Winters and springs will become wetter. Climate change will bring more frequent and heavy downpours which is likely to result in surface water as well as sewer and groundwater flooding. Currently, one in six people around the world are at risk from flooding. Climate change will increase the number of buildings and infrastructure at risk from flooding and even threaten people’s lives.

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Rescuers evacuate people from flooding to safer area in southern city of Kerala, August 8, 2018. REUTERS/Sivaram V



Truck transporting boats to flooded area across a water-logged road in Kerala, India, August 18, 2018. REUTERS/Sivaram V

Sea-levels will rise. Scientists predict that the average sea-level around the world will rise by 2060 cm or even more in the next 100 years.


The following regions would be particularly at risk from rising sea-levels and erosion:

- Bangladesh
- China
- Philippines
- Tuvalu
- Maldives

In all, climate change will have destructive impacts on the natural and human environment around the world which will require extensive strategies to tackle.

2. Low Distance (Local) Condition

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CLIMATE CHANGE FOCUS

Overview of Impacts for the UK

'Climate change' refers to changes in the Earth's temperature and other climate-related phenomena (e.g., rainfalls, wind, humidity) since the industrial revolution. In the UK, average temperatures have risen by about 1°C between 1900 and 2010. It is important to note that changes in average temperatures are associated with other local climatic changes. For instance, in the UK summers have already become hotter and drier.



What are the consequences of climate changes for the UK?

Experts expect that (average global) temperatures in the UK could rise further between 1°C and 8°C in the following years. Such temperature rises will have drastic impacts on humans, animals, and plants.

- Hot and dry summers will become much more frequent. The effects of heat-waves will not only be experienced in large cities like London, Birmingham, or Manchester, where buildings and streets absorb and radiate the energy from the sun, but also in small villages. Droughts and water scarcity will occur more regularly, especially in the south of Britain. Climate change will significantly decrease agricultural yields. For example, yield of wheat (rice) could decrease by up to 5% across Britain.
- Winters and springs will become wetter. Climate change will bring more frequent and heavy downpours which is likely to result in surface water as well as sewer and groundwater flooding. Currently, one in six people in England and Wales are at risk from flooding. Climate change will increase the number of buildings and infrastructure at risk from flooding and even threaten people's lives.

Most scientists attribute recent climate change to human behaviour rather than natural causes, especially to greenhouse gas emissions (i.e., carbon dioxide, methane), which artificially warm the earth's atmosphere. A substantial proportion of these emissions are caused by deforestation and burning fossil fuels such as oil and coal to produce food, heat buildings, and drive cars.


Sea-levels will rise. Scientists predict that the average sea-level around the UK will rise by 2060 cm or even more in the next 100 years. The following regions would be particularly at risk from rising sea-levels and erosion:

- south Wales
- north-west Scotland
- Yorkshire and Lincolnshire
- East Anglia
- Thames Estuary

All in all, climate change will have many different impacts on the natural and human environment in the UK which will require extensive strategies to tackle.

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Local residents canoe through flood water as they help to rescue people on a residential street in Carlisle, Britain on Dec. 6, 2015. REUTERS | MEDIA EXPRESS

Study 4

Action Intentions

Now we would like to ask about your intentions regarding the Transition Towns movement.

1. I intend to work in local Transition Towns initiative projects to improve air quality/combat climate change.
2. I plan to take part in of Transition Towns activities in my neighbourhood
3. I expect that I will be able to attend Transition Towns meetings and activities in the future.
4. I would be willing to sign a petition to push the governments worldwide to legislate for policies that slow or stop climate change/reduce air pollution.
5. I intend to join a protest to demand that politicians should take necessary actions to lower carbon emissions/improve air quality
6. I am willing to donate to environmental organizations which aim to enforce governments for reduction of carbon footprint/improvement of air quality (**new item**)

Efficacy (air pollution)

Now please consider the possible effectiveness of the Transition Towns movement. Please read the questions and give your answer to each one without spending too much time on any one question.

1. Through joint actions, Transition Towns groups could effectively contribute to local improvement of air quality.
2. Transition Towns groups could make an effective contribution to solution of air pollution problem.
3. My active collaboration would be a significant contribution for a local Transition Towns group to reach its goals through joint actions.
4. With my active collaboration I would make a significant contribution that a Transition Towns group could work effectively for local air quality.
5. I think it would be easy for me to take part in local Transition Towns activities.
6. I have enough time and resources to work for Transition Towns initiatives If I wanted to.

Social Distance (air pollution)

Please rate your disagreement/agreement with the following statements.

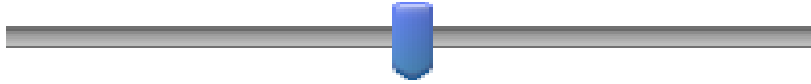
1. Air pollution will mostly affect developing countries.
2. Air pollution is likely to have a big impact on people like me.
3. Countries like my own will experience serious impacts of air pollution.

Temporal Distance

In your opinion, when will we begin to experience the most serious impacts of air pollution?

2020

2120

**Spatial Distance (air pollution)**

Please rate your disagreement/agreement with the following statements.

1. My local area is likely to be affected by air pollution.
2. Air pollution is a problem for areas that are far away from here.

Uncertainty (air pollution)

Please rate your disagreement/agreement with the following statements.

1. The seriousness of air pollution is exaggerated.
2. It is uncertain what the effects of air pollution would be.

Risk Perceptions (air pollution)

How likely do you think following events would occur due to air pollution in the next 50 years?

1. Severe health problems will occur where I live.
2. My standard of living will decrease substantially.
3. Air pollution will significantly affect me and my family.
4. Worldwide health problems will occur.
5. People's standard of living would decrease worldwide.
6. Air pollution will be a significant threat for the people all around the world.

Experimental Manipulation

1. Climate Change Condition

Climate change is considered as one of the biggest environmental threats of 21st century. Most scientists agree that the unprecedented temperature rise caused by climate change will have drastic impacts on humans, animals, and plants in the following years. There are some initiatives that help mitigate climate change by building “local energy autonomy”.

A prominent example of emerging community-based collective action initiatives is Transition Towns (TT) movement. It aims at mobilizing community action engagement around climate change with the objective of bringing about a transition to a low-carbon economy which would help stop climate change. TT initiatives pursue many locally based activities practices around energy consumption, for example establishing locally owned renewable energy companies, promoting locally-grown food, encouraging energy conservation, exemplifying low-carbon living, and building supportive communities around these. TT initiatives also organize collective action by these communities to increase government spending on renewable energy technologies to mitigate climate change.

2. Air Pollution Condition

Air pollution is considered as one of the biggest environmental threats of 21st century. Most scientists agree that the unprecedented level of air pollution will have drastic impacts on humans, animals, and plants. There are some initiatives that improve air quality by building “local energy autonomy”. help improve air quality. TT initiatives pursue many locally based activities practices around energy consumption, for example establishing locally owned renewable energy companies, promoting locally-grown food, encouraging energy conservation, and building supportive communities around these. TT initiatives also organize collective action by these communities in order to increase government spending on renewable energy technologies to reduce air pollution.