The Ideological Contributors to Climate Change Risk Perception: A Cross-National Study of Politics, Religion and Postmaterialism

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Abstract

The purpose of this research is to provide detailed exploration of sociological and socio-psychological contributors to two forms of climate change risk perception, country risk and world risk. The primary focus of the research includes ideological factors including religion, politics and postmaterialism. Religion in particular has been underexamined across the literature, with little understanding of how the various elements of religiosity influence climate change attitudes. The research therefore develops theoretical expectations for the effects of religion and tests these theoretical expectations in both a 3-country analysis and a multilevel analysis of 28 countries. The research also aims to provide greater depth to understandings of how politics functions as a driver of risk perception globally.

The 3-country multivariate linear regression analysis focuses on Finland, Japan and the USA, which vary substantially in their political and religious characteristics, with important commonalities including being high-income democracies, shown in country profiles. The 2nd analysis chapter utilises multilevel models with exploration of individual-level and aggregate-level measures for religion. While individual-level religious affiliation was not important for explaining variation in climate change risk across most countries, with the US being a notable outlier observed in the 3-country analysis, religious attendance, majority religion and proportion of Christians in a country indicate effects on risk perception across countries, emphasising the multifaceted nature of religiosity, particularly from a global perspective.

The final analysis contributes to literature pertaining to politics and postmaterialism with an exploration of identified mechanisms in a cross-national context using multilevel models. Random Slopes models indicate that left-wing ideology indicates strong homogeneity across countries, with consistent risk perception amongst individuals in this ideological category. Meanwhile, the climate risk perception of centre-right and right-wing individuals varies substantially across countries. The research identifies religious attendance, postmaterialism, majority religion and national wealth as factors contributing to this variation.

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1. Introduction

1.1 The unique challenge of anthropogenic climate change

Climate change is a fascinating issue from a sociological and socio-psychological perspective. The scientific evidence regarding the unprecedented rate of change beginning during the industrial revolution, primarily through increased saturation of greenhouse gases in the Earth's atmosphere and accelerating in-line with the increasing consumerism, industrialisation and economic development globally (USEPA, 2025; IPCC, 2021; Thøgersen, 2021). This has marked the shift, in geological terms, from the Holocene to Anthropocene[1] epoch, emphasising the unique moment in Earth's long history wherein humans are the primary drivers of global planetary system change.

The changes in the climate are relatively gradual from a human perspective, yet radical from a geological one. Climate records continue to be broken year on year, with the threat of tipping points – critical thresholds that lead to significant, and likely irreversible, change in the ecosystem – such as the thawing of carbon-rich permafrost emphasising the risk of ineffective and insufficient action (ESA, 2023). The impacts of climate change and vulnerabilities of ecosystems vary significantly across geographies (IPCC, 2022), with "approximately 3.3 to 3.6 billion people" living in highly vulnerable areas. Flooding, wildfires and droughts are increasingly prevalent in line with the expectations of climate scientists, with projections of accelerated disruption to ecosystems and societies alongside continued rises in average global temperature (IPCC, 2022).

The anthropogenic origins of the issue challenge both humanities' perspectives on our capacity to influence planetary systems and our capacity to address an issue with radical implications on how our economic and social life is organised and maintained. This is, understandably, a difficult realisation to embrace fully, and provides context for the driving motivation behind this research. While humans have been aware of the fragility of life on our planet prior to the overwhelming evidence regarding climate change emerging; likely made clear for many by the

[1] Or Capitalocene (Moore, 2017).

first nuclear tests at Los Alamos, the first and only use of the weapons on civilian populations in Nagasaki and Hiroshima, and subsequent arms race between the USA and Soviet Union that typified the latter half of the 20th century.

While the proliferation of these weapons may, for many and possibly in reality, still represent the greatest threat to humankind, the issue of nuclear weapons, amongst the litany of emerging competitors for our attention including global pandemics and Artificial intelligence, remain distinctly different from the issue of climate change. While the former threats offer the potential to radically alter the viability of the regular functioning of human societies almost overnight, climate change remains situated in the background, as a long-term, aggregated and somewhat intangible threat. Increasingly, scientists are able to predict with greater certainty the *likelihood* of given natural disasters having been exacerbated by climate change – with media reflecting the nature of this cautious attributive perspective, with regards to the 2025 LA fires, the BBC (McGrath, 2025) quote Professor Stefan Doerr who indicates that while fires are common in the region, California has overseen notable increases in both "the length and extremity of the fire weather season". Nonetheless, characteristic of the proper epistemological cautiousness of the scientific discipline, Professor Doerr emphasises "it is too early to say what degree climate change has made these specific fires more extreme", with detailed attribution analysis to follow.

This emphasises the uniqueness of climate change as an issue. There would be little scope for this level of cautiousness should a nuclear bomb be dropped on a city, or a pandemic spread throughout an entire population as it did recently with Covid-19, or an Artificial Intelligence seize control of vital information infrastructure; the nature of the disaster wrought by these issues would leave little scope for reasonable doubt regarding causality. Meanwhile, climate change is reaching an increasingly advanced and indeed tangible position as an existential threat, and yet by its very nature remains invisible, silent, and *relatively* slow in manifesting its destructive capacity. This context provides an indication of the uniqueness of climate change from a socio-psychological perspective, and the conceptual challenge for all individuals in gauging the risk it represents to themselves, their family, community, country and to the world as a whole.

1.2 Risk and the double-edged sword of ideology

The above section highlights the conceptual uniqueness of climate change, with this context being important for the scope of this research. The goal of exploring the role of ideology as a contributor to climate change risk perception is situated within an environment of general intangibility, geographically asymmetrical impacts, and systemically resistant, material interests. This complex environment coincides with a number of potential ideological contributors to risk perception, and an even greater number of factors comprising and shaping the role these ideological contributors. While it is difficult to separate forms of ideology in terms of their psychosocial influence in a systematic manner, the broad aim of this research is to explore historically pertinent ideological influences, captured primarily by religion and a lesser degree culture, which is conceptualised more as a medium through which both religious legacies interlace with contemporary influences including media, economic shifts and the political environment. Political ideology is conceptualised both as a reflection of contemporary discourse, as well as institutional influences, which are also subject to the ongoing legacies of major religion, while also having the capacity to shape these legacies as well as cultural tides to suit particular agendas within the given period. Therefore, while these factors intersect and likely influence one another in various ways, a loose hierarchy of ideological order is established, from religion and morality at the bottom, through culture and values, to political ideology situated as that with possibly the greatest conscious role in shaping climate perceptions, while also being more subject to change in many ways than the prior forms of ideology.

These three forms of ideology are the primary contributors to climate change risk perception explored throughout this research. Each is expected to exert both unique and combined effects on risk perception, to differing degrees across ideological categories and countries. To adequately explore the influence of religion, culture, values and politics on conceptualisations of climate risk, multiple countries with substantially different histories, cultures and societies are taken into consideration. The evidence indicates that individuals in most countries on average view climate change as at least somewhat of a threat (LRF, 2024; Ritchie, 2024). How this risk perception emerges and varies across different ideological categories, and why this

variation persists, is the primary research aim for this thesis. It is expected that, unlike the epistemological caution characteristic of scientists, individuals influenced by ideology will have vastly divergent perspectives on the veracity of the threat posed by climate change, with perspectives ranging from it representing a benign, exaggerated or non-existent issue to one representing an immediate, apocalyptic and overwhelming issue. These perspectives, and the innumerable variations in-between are considered to be far less pertinent without the influence of ideology, emphasising the rationale for this research.

Indeed, the research identifies an important role for each ideological category to varying degrees. Political ideology is a key contributor to climate change risk perception across countries, with the political right generally indicating lower risk perception. Reasons for this relationship are also identified, and include religious attendance, postmaterial values, majority religion and national wealth. Individual religious affiliation is not identified as an important ideological contributor to climate change risk perception, but less commonly utilised measures including attendance of religious services, majority religion and proportion of Christians all emphasise that religion continues to shape attitudes through both individual practice, institutional and historical legacies and macro-demographic makeups. Postmaterialism plays a somewhat peripheral role relative to the other two ideological categories, but its position as a mechanism shaping the risk perception of contrasting political ideologies implies a contemporary cultural shift which reframes prior conversations about the nature of postmaterial priorities.

1.3 Structure of this thesis

The first section of Chapter 2 is an exploration of the empirical evidence regarding contributors to climate change risk perception, including religion, values, and politics as well as other important factors identified including sociodemographic and attitudinal measures, personal experiences of extreme weather, as well as country-level elements including GDP per capita, major religion, climate policy and emissions. Following this, the 3 countries explored in the first analysis chapter (Chapter 4), namely Finland, Japan and the USA, are explored in greater detail to provide context to this analysis and emphasise the unique environments that individual countries can foster as influences on climate change risk perception. The final section in

chapter 2 is a theory of religion, included due to its position as the least developed of the primary ideological contributors explored in this research, setting up the 2nd analysis in chapter 5.

Chapter 3 lays out the methodology utilised in the subsequent analysis chapters, with the rationale for the methodology, data selection and access and explanations for how the methodology is interpreted included. As stated, Chapter 4 is a 3-country analysis of Finland, Japan and the USA. This chapter explores the relationship between climate change risk perception and religion, politics and values in detail, which provided important lessons for the next two analysis chapters while also clarifying each country's unique relationship to the proliferation of climate risk perception across their populations. Chapter 5 includes the first analysis of 28 countries, with a specific focus on both individual and country-level religion and assessing the empirical evidence alongside the expectations outlined in the theory section in chapter 2. Chapter 6 offers an extensive exploration of the influence of political affiliation upon climate change risk perception across the 28 countries, with evidence regarding mechanisms impacting the effect of politics upon risk perception including postmaterial values, GDP per capita and majority religion. Chapter 7 includes a discussion of the results from the 3 analyses, the implications of these results, how the research fits into existing research, limitations and scope for future development on the findings. Finally, a full list of references and an appendix with additional tables and figures are included.

2. Literature Review, Country Profiles and Theory of Religion

2.1 Literature Review

This research focuses on individuals' climate change risk perception across several countries. Throughout this literature review the concept of risk perception will be analysed in a manner relevant to the issue of climate change, showing areas of academic debate regarding definitions, the appropriacy and distinctions between the different terms used. This will be analysed in the context of the potential relationships between the proposed contributors to climate change risk perception and the mechanisms shaping these relationships that continue to be debated across the literature. Therefore, literature relating to concern, and other affective indicators will be explored throughout, and this will be made explicit to retain the precision prompted by the differences between each measure. Finally, gaps in the literature are identified explicitly, with an indication of the specific gaps that this thesis will aim to address throughout its theory and analysis chapters.

Dunlap and York (2008) note that as "environmental concern and activism have become commonplace" in both poor and rich nations, scholarly work must move beyond a desire for parsimony and reductive explanations and instead seek to understand the full range of contributors to risk perception. The varied origins of environmental risk perception likely translates to similar complexity for climate change risk perception, and the forms of environmentalism produced in differing contexts may also vary in character (Nawrotzki & Pampel, 2013). Indeed, proposed contributors of climate change risk perception vary significantly across countries (Dabla-Norris et al. 2023). The primary orientation of this thesis towards the ideological contributors to climate change risk perception from a cross-national perspective provides an opportunity to explore and develop upon the bases of theoretical understandings in the field and better understand why risk perception may differ within countries as well as between them.

2.1.1 Climate Change Risk Perception

Risk perception, worry, concern or something else altogether?

Debates regarding the appropriacy of the terms used to refer to personal, cognitive engagement with the threat of climate change remain somewhat unsettled. Concern, risk perception and worry are those used predominantly in academic research, and these can be differentiated with regard to how the subjectivity of an individual is considered (van der Linden, 2017). The interchangeable usage of these terms is subject to debate due to the requirement that there be a high level of correlation between them, which is not always found to be the case (ibid, 2017; Lo & Chow, 2015). In a risk-related study of Israeli citizens, Levy and Guttman (1976) note "sharp distinctions" between self-reported "worry, fear and concern" following a war. The absence of "precision and standardization [sic]" in measurements is a commonly noted problem across risk literature due to the fact it makes comparisons between studies more difficult (Wolff, Larsen & Øgaard, 2019).

Further, the problem of semantic differences between different studies and academics, as well as the problems of utilising survey data where the subjects' understandings may differ (ibid), mean that each term is unlikely to capture precisely the same meaning across a particular topic, let alone an entire academic field (Van der linden, 2014). Van der linden's (2014) study attempts to bring clarity to the "cognition-emotion" dilemma, which refers to the debates surrounding the directional flow of causal pathways between the factors of risk perception, affect and personal experience. Ibid's (2014) findings highlight that while SEM analysis[2] does indicate that personal experience should be regarded as a causal indicator of risk perception and affect, risk perception and affect should be viewed within a "mutually reinforcing and reciprocal" relationship rather than unidirectional. These considerations must be kept in mind when comparing work using variations of this terminology.

Lo and Chow's (2015) study regarding the relationship between national wealth and climate change concern highlights the pitfalls with equating concern and risk perception explicitly. Ibid

[2] Structural Equation Modelling (SEM) is a multivariate statistical analysis method use to analyse structural relationships between measured variables, in the above example risk perception and affect, and latent variables, including personal experience and cause knowledge above (Van Der Linden, 2014).

(2015) find that GDP per capita has a positive impact on "perceived importance of climate change" and a negative impact on risk perception "defined as perceived danger of climate change." Concern could fit into either of these definitions, and if used haphazardly, could lead to contradictory interpretations of results. There are examples of multiple conceptualisations of environmental concern being used in single studies, with Marquart-Pyatt (2012) analysing at "three measures of environmental concern: environmental threat awareness, environmental efficacy, and willingness to pay". The types of concern and risk perception measured in studies referenced throughout this literature review will be made as clear as possible primarily because these distinctions may prove to extensively impact the conclusions that can be drawn from this body of literature meaning care needs to be taken in this regard. Further, the specific conceptualisation used in the research must be chosen with care in order to make sure comparisons with past studies are properly congruent in the types of measures used.

There are also measures commonly used that do not attempt to capture concern, worry, or risk analysis directly, and yet can be argued to be very closely related and/or collinear to these measures. Studies focusing on climate change scepticism, for example, show that similar factors influencing scepticism also understandably indicate lower levels of climate change concern (Whitmarsh, 2011). However, Tranter & Booth (2015) find that across high-income countries these two are not always tightly correlated. There can also be some overlap with environmental and climate concern, as while there are important distinctions between environmental issues and climate change, which will be further expanded upon in the next section, the abundance of evidence relating to environmental concern can certainly be relevant to debates regarding climate change concern (Marquart-Pyatt, 2012). As such, while the differences between these measures are once again vital to understand for the importance of precision, the understandings gleaned from these related fields of research may prove important for aligning theoretical expectations moving forward, especially where evidence regarding climate change risk perception specifically may be lacking.

Conceptualising Risk Perception

Climate Change risk perception is increasing globally, with a majority of high-income countries observing a progressive increase over the last decade (Fagan & Huang, 2019; Capstick et al.

2015; ESS, 2018). Research attempting to determine the reasons for climate change risk perception has been undertaken for several decades, however, the shifting tides of popular opinion remain an important focus due to the varying and evolving determinants of environmental and climate risk perception (Klineberg et al. 1998). Furthermore, the determinants are likely to predict perception asymmetrically across countries. For example, political affiliation is a particularly strong predictor of climate change risk perception in the United States and is less so in European and Australasian countries (McCright & Dunlap, 2011a). These effects can supersede other predictors too, with education becoming less important in the US when analysed alongside political affiliation (Kahan et al. 2012). Therefore, in-depth cross-country analysis may be valuable for explaining the differences between them. The variations in the strength of contributors' effects will be noted in detail later in this review.

The concept of risk perception is complex and has been subject to significant academic debate due to its general importance as a measure of public opinion as well as regarding specifically environmental issues. Farrokhi et al. (2020) utilised content analysis to explore psychological aspects of climate change risk perception, while attempting to make explicit the constituent elements of risk perception in the case of climate change. They note 3 main dimensions all containing subcategories. The first mental health dimension includes subcategories of emotional and mood effects, and personal experiences of risks. The second cognitive dimension is comprised of available information and the nature of the phenomenon. Finally, the dimension relating to the interaction of imposed components includes fiscal consequences, social contexts, religious cultural components, political factors and environmental components.

Stern and Dietz (1994) provide a triad of individual concern, "social-altruistic, biosphere and egotistic", which refer to concern for others in society, the planet and natural environment, and oneself and perhaps your immediate family (Schultz, 2001). Schultz (2001) research indicates that the triad captures the characteristics of concern across the 3 research groups covered: US college students, the US public and college students from 10 countries, further reinforced by results from more than 20 countries in later studies (Milfont, Duckitt & Cameron, 2006). The triad indicates that individuals' reasons for concern, conscious or not, can vary significantly, Nonetheless, the elements of the triad are interconnected, with Schultz (2001) noting

biospheric concerns' positive relationship with self-transcendence and negative relationship with self-enhancement, implying the egoistic perspective may be more independent from the other two. These may also relate to the differences between perspectives regarding global and country risk noted above.

Interestingly, the degree to which an individual perceives themselves interconnected to nature is increasingly posited as a determiner for different types of environmental concern too. For example, Americans and Europeans in cities viewing climate change 'egoistically' may stem from detachment from nature (Hertsgaard, 2000). However, Hertsgaard's example is contestable from the standpoint of value formation wherein socioeconomic wellbeing may have led to an increasing number of individuals holding postmaterial and/or self-transcendent values that may be more focused upon biospheric and altruistic concerns for the environment beyond the self or even humanistic standpoints (cf. Janmaat & Braun, 2009). This debate will be explored in more detail during the following sections regarding postmaterialism and religion. Nonetheless, an individual's subjective position in nature is also a debate that will be considered carefully moving forward.

It is important to note that for citations of research pertaining to environmental risk perception generally, several distinctions must be kept in mind. Climate change risk perception must be conceptualised separately from environmental risk perception, as while they're likely closely correlated and mutually reinforcing in certain circumstances, tangible environmental degradation does not necessarily equate to subjective attribution of this degradation to climate change (McClure et al. 2022), which in itself impacts levels of climate change concern (Ogunbunde et al. 2019). It is also difficult to objectively attribute any single weather event to climate change, or even weather trends over a few years, though an "emerging field of climate science" known as 'Extreme Event Attribution' has seen success in providing reliable estimates of how the risks change over time (WWA, 2022). As such, climate change is properly understood through a probabilistic and longer-term temporal conceptualisation.

Nonetheless, it may be the case that increasingly individuals equate 'environmental change/degradation' with climate change, due to its mass problematisation in nearly all facets

of society, meaning subjective understandings of the reality of climate change needn't necessarily be akin to the scientific reality in order to indicate risk perception. This is exemplified well by many citizens considering the possibility that volcanic eruptions becoming more frequent because of climate change. Other than in Denmark, Germany and Japan, more than half of individuals in other high-income countries are concerned that volcanic eruptions may increase due to climate change (Dechezleprêtre et al. 2022). While there are some potentially related processes (cf. Aubry et al. 2022), there is no scientific evidence linking them in any meaningful way, and this shows that environmental hazards are sometimes grouped together in individual subjectivities. As such, while environmental risk perception literature will remain useful throughout this review, the above conceptual differences will remain relevant.

Another important aspect often left unconsidered in risk perception research is the differences between an individuals' climate risk perception both in terms of the impact upon their country and the planet as a whole. This is vitally important as while awareness of climate change is highest in OECD countries, evidence indicates that risk perception is lower in these countries than the global average (SPI, 2022). Individuals in high-income countries consider the impacts of climate change to be worse for the world than for their individual country (Sampei & Aoyagi-Usui, 2009). This could be due to several reasons. Firstly, the experience of the effects of climate change amongst individuals in these countries is likely through secondary exposure i.e. through media coverage, with tangible effects less prevalent than those experienced by people in different areas across the world. Secondly, there may be an expectation amongst citizens of higher income countries that the relative technological and material advantages of their country may provide a level of protection from the excesses of climate change.

Nonetheless, the prevalence of environmental degradation, and subjective attribution of this degradation to climate change, in certain countries in recent years may contribute to uneven shifts in this regard, with the possibility of 'closing the gap' between global and country risk perception, or perhaps overall levels of risk perception may have increased in both cases. Indeed, Aoyagi (2020) shows that compared to 4 European countries, Japan has the highest risk perception, including levels of extreme worry. This correlates with Japan's citizenry also stating that (in Japan) 'we are already feeling the effects' of climate change in significantly higher than

the same 4 European countries (ibid). This shows the correlation between the factors posited above, which will be explored in more detail in the following section. Overall, there are clearly significant differences between countries in terms of risk perception, with variations within countries in terms of perceived global and national impacts. Due to the fact that risk perception has been forwarded as a prerequisite to effective adaptation (Krylova & Reale, 2022), the importance of ongoing risk analysis research of this kind remains vitally important. This thesis focuses on this construct, and a range of contributors explored in prior literature are explored below.

2.1.2 Individual Level Contributors to Risk Perception

Political Affiliation and Ideology

The varying degrees to which climate change has become a politicised issue across different countries, demarcated by national ideological or partisan divisions, indicates that political affiliation is a likely an asymmetric contributor to varying levels of climate change perceptions between countries including risk perception, concern, worry (Gregersen et al. 2020; cf. Tranter & Booth, 2015). Generally, though, the further ideologically right an individual tends to be, the less likely they are to be concerned with climate change (Tranter & Booth, 2015). Further, populist right politics is associated with lack of trust in environmental institutions and climate scepticism (Krange et al. 2021; Kulin et al, 2021) However, ideological differences within countries are likely to still incur varying conceptualisations of the issue and its solutions within similar ideological camps (Kulin & Sevä, 2024). Meanwhile, evidence often indicates a lack of significance between those on the ideological left and those more moderate leaning, indicating that the issue is unevenly politicised, with high levels of scepticism being a characteristic more peculiar to the far right (Lujala et al. 2015; Tranter & Booth, 2015).

The United States has perhaps to the most fraught public discourse regarding climate change and illustrates the power of political affiliation. The position of a many Republican politicians is that climate change is either a hoax or a greatly exaggerated problem (McCright & Dunlap, 2011a). And while there were some congressional shifts post-Trump away from denialism with the establishment of the Conservative Climate Caucus (Williams, 2022), the new Trump

administration appears adamant in following their prior path (Milman, 2025). Overall, this coincides with differences between parties at the population level with 88% of Democrats viewing climate change as a major threat, with only 31% of Republicans (Kennedy, 2020).

Studies regarding public perceptions indicate that political affiliation is the strongest indicator of climate change risk perception within the US, superseding contributors such as scientific literacy (Kahan et al. 2012) and impacts subjective attribution of experience of weather events associated with climate change such as flooding (Bruine de Bruin et al. 2014; cf. Bergquist et al. 2019) and temperature changes (Shao & Goidel, 2016). Explanations for this include the anti-reflexivity thesis (Gregersen, 2020), which emphasises the role of societal sectors including think-tanks, lobbyists and media organisations in undermining the consensus amongst environmental and climate scientists regarding the causes and impacts of climate change, which in the US are particularly prevalent actors.

Cross-country research indicates that political affiliation or ideology retains its power as a predictor of climate change risk perception, with “extreme left” being the most likely to be concerned, while moderate and “extreme right” sequentially less likely (Kvaløy et al. 2012; Hornsey et al. 2016). This is true for perceived seriousness of the threat posed by climate change too (McCright et al. 2015). However, these effects are primarily weaker within Central and Eastern European countries compared with Western Europe (Poortinga et al. 2019; McCright et al. 2015) and Scandinavia (Aasen, 2017). Reasons for these differences depend on partly on historical factors, with former communist countries all indicating no significant role for political ideology in these countries (McCright et al. 2015), as well as different meanings for left and right in these countries (ibid).

Further, the variations between different political parties in each country is very important to consider in that, for example, moderate-right parties often differ within and across countries in their climate policy approaches, as seen in the UK Conservative party leadership debates with discussions regarding the feasibility of net zero (Horton, 2022), and this may be reflected in moderate-right voters in different countries too. The Conservative party leadership’s rhetoric regarding climate change has framed climate change as a threat especially in recent years and

has not expressed outright denial, and this appears to reflect the opinions of their voters too with party identification in the UK being shown to be an insignificant factor across a range of climate attitudes (Pearson & Wagner, 2025; cf. Clements, 2014). As such, individual political party affiliation and the country-specific meanings of 'left' and 'right' may be important contextual elements for considering the impacts of politics upon climate change (Gregersen et al, 2020).

Political parties can be either preference-shaping, in attempting to set the agenda for voters and move their positions on certain issues, or preference accommodating, by meeting the voters where their positions already are (Bale, 2010). On an individual level, the degree to which certain voters have adopted a party-line on the issue of climate change is likely to depend upon how partisan they are. Meanwhile, those that have adjusted their political affiliation depending upon climate policy or rhetoric, likely depends upon how highly a voter prioritises the issue of climate change, respectively. Empirical evidence suggests that elite cues, which are most likely to capture media attention, are the most significant indicator of public opinion (Carmichael & Brulle, 2017; Linde, 2020), clearly implying an important role for preference-shaping political leaders. This goes for elite cues from the political opposition too, which in the US have been shown to negatively impact climate risk perception. Former US Vice-President Al Gore's prevalence as an early climate campaigner, and the right's strong reaction against him (Merkley & Stecula, 2021), indicates that elite cues can have impacts upon not only their own side but also as a polarising force through galvanising the opposition against a stated position (ibid).

In relation to voters who prioritise climate change mentioned above, it is interesting that green parties across high-income countries have gained unprecedented electoral success (McBride, 2022; Nevett 2021), relative to their historical achievements, though the recent Bundestag elections in Germany may indicate a reversal of this trend (Niranjan, 2025). There is evidence within Europe that direct experience/awareness of the impacts of climate change does lead to higher propensity to vote for green parties (Hoffman et al. 2022). These effects are likely moderated by higher issue prioritisation as well as regional differences in income (ibid), which is interesting from the perspective of postmaterialism to be explored later. Higher political

priority for climate change doesn't necessitate a shift to green parties as shown in the 2022 Australian federal election, and this could be down to (left/liberal/centre-right) parties' general convergence towards public acknowledgement of the seriousness of climate change. While the Greens did make gains in the overall popular vote, the Labor party gained a majority following the two-party run-off against the Liberal/National coalition having promised a major shift in climate policy (BBC, 2022). Media have emphasised this fact, as well as former Lib/Nat PM Scott Morrison's inaction on climate change as a "watershed" for this shift in power (The Economist, 2022; Tan, 2022). This signals that electoral systems could play a role in driving environmental/climate issue voting, with majoritarian systems generally leading to an undermining of third parties.

Australia's unprecedented extreme weather in the form of wildfires, droughts and temperature increases is argued to a play a role in the issues prevalence, making for an interesting point of focus regarding experience of, or proximity to, extreme weather within different countries, and the power of political affiliation in comparison for explaining risk perception. While evidence from Australia mirrors the US and global analysis in that affiliation with the ideological right indicates lower climate change risk perception (Hughes et al. 2020), the aforementioned evidence from the US regarding the *primacy* of political affiliation opens up the possibility of discussion regarding the relative power of indicators within different countries, as well as the role they play in moderating the power of other factors within these countries. Meanwhile the evidence from Europe above indicates that political affiliation may be more flexible according to issue voting, rather than the seemingly opposite relationship in the United States.

The politicisation of climate change also opens up important discussions regarding the impact of politically motivated reasoning and attention on perception of the issue. Luo and Zhao (2019) explored the impact of political motivations on attention to climate information, and how "attentional biases alter the perception of climate evidence and influence subsequent" mitigation behaviours. For example, conservatives, with their higher likelihood of scepticism, were more likely to attend to the flatter areas of a visual global temperature chart and would disengage if their attention was drawn to the rising temperatures (ibid). Their results are consistent with the notion that individuals avoid information that is inconsistent with their

world view, or self-concept, to reduce cognitive dissonance (Thibodeau & Aronson, 1992), as well as confirmation bias, where individuals look for information that supports their world view and/or cultural values (Kahan et al. 2011). Evidence of motivated reasoning can also be found in how partisan voters react to elites from the opposing political side mentioned above (Merkley & Stecula, 2021; McCright & Dunlap, 2010).

This research expects that political affiliation will retain its influence in the United States, and will also be influential in other high-income countries, though this will vary significantly depending upon the influence and character of the centre-right and far-right parties within these countries, as well as how *ideologically* right-wing the individuals in the population tend to be. It remains important to continue to enquire into the influence of political affiliation and ideology alongside the evolving positions of political parties, as climate change becomes a more tangible issue, can help to understand levels of polarisation within countries as well as the developing positions of individuals. As these differences may also be explained by social and religious values held by individuals such as postmaterialism, which are expected to influence political ideology more than vice-versa, observing how risk perception for climate change can evolve amongst groups with different value systems may also open up new areas for debate regarding which elements of climate change discourse have influenced these changes or continued fervour for particular positions. This will become relevant below when the appropriate mechanisms are discussed in subsequent sections.

Religion

The relationship between religion and climate change risk perception is a fascinating sociological question. Individual affiliation, belief and attendance are primary in the sociological study of religion, however, there is also scope for analysing the differences between countries based on ideological perspectives extending from the legacies of major religions, with this possibly influence environment and climate perceptions differently based on these origins.

Literature indicates that the Christian perspective pertaining to humanity's 'God-given' domination or stewardship over nature may be partly responsible for "allowing or promoting Western societies' exploitation of nature" (White, 1967; Kvaløy et al. 2012). This argument

emphasises theology as manifesting in a macro-ideological sense akin to the 'Protestant Ethic' (Weber, 2001), with a tacit embedding of "Christian theological understanding of nature" within Western modernity (Tyson, 2021), despite the fact that individuals profess religious affiliation in lower numbers. Tyson (ibid) labels this Progressive Dominion Theology (PDT), which, as with Capitalism in Weber's theory, no longer needs professed belief in Christianity theology to function. As such, should this hypothesis hold true then it would be unlikely that simple demographic measures of religion would capture this trend in the contemporary setting, due to the fact that such an ideology would transcend religious affiliation. Therefore, measures of religious practice and institutionalisation are also vital to understanding the contribution of religion to climate change risk perception. This emphasises the goal of this thesis to explore religion and religiosity from both individual and country-level differences, with the latter more extensively explored in section 2.1.3.

There are significant differences between religious interpretations of humanity's relationship with nature. The Buddhist principle of Bodhicitta (Dorzhigushaeva & Kiplyuks, 2020) and the Hopi Native American concept of Koyaanisqatsi ("life out of balance") are very much aligned with concepts of conservation and sustainability. This indicates that the particularities of religious teachings, as well as the adherence to religious practices within each socio-cultural context, may indicate an asymmetric influence of religion on environmental concern as well as some interactions with value systems noted above. Therefore, its measure at an individual level remains a potentially illuminating factor regarding climate change risk perception. Tjernström & Tietenberg (2007) highlight theological distinctions between Abrahamic religions and eastern religions including Buddhist and Hinduism in terms of their views on the dualism of Humanity and the environment, with the latter rejecting this dualism in favour of a more holistic perspective. Ibid indicate that individual religious affiliation measured according to this dichotomy does not significantly indicate climate change risk perception, though the effect for Buddhism/Hinduism is positive as they predicted.

Mostafa's (2016) study of 40 countries finds religiosity, measured by 'importance of god' and 'frequency of prayer' to be positively related to climate change concern. However, evidence regarding the impact of religious affiliation varies between countries. In the United States,

general religious affiliation has negative and significant impact upon environmental concern (Michaels et al. 2021), though differences between the largest denominations of catholic and protestant aren't shown to be significant (ibid). Interestingly, Arbuckle (2016) highlights a moderating impact of religious affiliation between ideology and concern about climate change, where concern "is suppressed among liberals in the Evangelical, Black Protestant and Catholic traditions and enhanced within the Jewish tradition". The fact that this effect is more prominent in amongst politically liberal individuals indicates that these more conservative forms of Christianity override the strength of political affiliation where these two factors may be in tensions with one another regarding climate change (ibid). Meanwhile, Judaism's more theologically liberal practice in the United States, with high levels of Reform Judaism (Ausubel et al. 2021), aptly explains its positive interaction with political liberalism. Christianity and political conservativism appear more harmonious in their interaction, indicating lower climate change concern more reliably. This shows that different religions can indeed have unique impacts on environmental perceptions, and cannot be viewed monolithically (Mostafa, 2016).

Along similar lines to Mostafa, Felix et al. (2018) utilise a measure of 'religiousness' rather than individual religious affiliation to analyse environmental concern. This is based upon respondents answering whether they consider themselves a 'religious person' or not. Ibid counter White's thesis showing that on average across 34 countries, religious individuals indicate higher environmental concern than non-religious and atheists. Zemo & Nigus (2021) use four measures of religion: attendance, importance of God, membership of religious organisations and religiosity (the same WVS measure used by Felix et al. (2018)). Zemo & Nigus find that positively contribute to several environment indicators; individuals who report high attendance, importance of God and religious membership agree with the notion that environmental protection should be prioritised over economic growth. This indicates the importance of differentiating between both measures of religiosity and environmental attitudes. Broad environmental protection and climate change risk perception differ in important ways.

Pepper & Leonard (2016) focus on Australian churchgoers, which likely provides a perspective upon more devout religious groups than the general population. Similarly to the United States,

more conservative denominations, in this case Pentecostals and Protestants from smaller denominations, are most likely to be sceptical of anthropogenic climate change (ibid), though the study doesn't provide a direct measure of risk perception. Interestingly, the ecotheological perspective regarding humanities' dominion over nature, "a perspective that impeded environmental concern", remains "more prevalent among Australian Pentecostals" than other Christian denominations and the general population (ibid). This highlights that in the contemporary setting, specific religious teachings can have a significant impact on individual perceptions regarding the environment and climate change. It also indicates that the proliferation of PDT across the general population remains less impactful amongst those who are not directly inculcated with the idea through individual religious practice. This could offer a potential rebuttal to White's macro-historical thesis in the contemporary setting, wherein environmental and climate change risk perception have grown significantly, while supporting the notion that Christian teaching regarding dominion over nature nonetheless does lead to lower environmental risk perception.

Understandings and manifestations of religion or even politics may vary; according to Ives & Kidwell (2019) western conceptions of religion as "an established set of beliefs", as dogmatic, "does not represent many eastern or traditional religious systems" where practices may take precedence over specific beliefs and may not be as firmly institutionalised (Nelson, 2012). This is an important consideration, as the evidence explored in the literature review regarding Christian perspectives on man's relationship with nature and the potential impact of such an ideology, may not coincide with the same level of ideological practice as other religions. Indeed, this understanding of the influence of Christianity is likely to vary significantly across 'Christian', or Christian majority, countries themselves. Therefore, each country's religious history and contemporary religious thought, practice and institutionalism may be important in developing accurate understandings of its potential influence on climate change perceptions. From a sociodemographic perspective, capturing these macro-historical ideological trends in a single point in time is difficult on the individual level and would not sufficiently capture the importance of the social-psychological impacts of religion (Michaels et al. 2021). Measuring

differences between individuals' climate change risk perception across countries may uncover these differences more effectively, discussed in section 2.1.3 below.

This research expects most forms of religious affiliation to indicate lower climate change risk perception, with this effect being more pronounced amongst Christians than other religions. This is expected to vary substantially by country, with many countries indicating no relationship between religious affiliation and climate risk perception. Individual religious practice e.g. attendance of religious services is also expected to have a generally negative impact on climate change risk perception, though this is likely to vary by countries due to differences in religious demographics and forms of practice too. With evidence regarding environmental risk perception indicating the opposite in many cases, the differences in conceptualisation between climate change and the environment more broadly may be crucial in discussions regarding the potentially asymmetrical influence of religion on these issues. This is explored extensively in the theory section (2.3). Furthermore, countries with different religious majorities may show different relationships and this will be interesting to explore in the context of climate change, with the notion of Buddhism as "a religion inherently close to nature" potentially having significant impacts on individuals' concerns within the country (Dessì, 2013). This also offers a point of contrast to the supposed anthropocentric nature of Christianity described by White (1967). Therefore, country-level analysis may also be illuminating for exploring institutional effects of the different religions explored, and literature relating to country-level analysis is discussed in below it is its own section.

Religion and Politics

Theory mostly indicates that values and religion are useful predictors of political affiliation, engagement, and ideology. The impact of religiosity on politics is a common theme in US focused literature, with evidence indicating that religiosity (religious or secular worldview) has a stronger influence than values (postmaterialist or materialist) (Layman & Carmines, 1997). Nonetheless, both cultural orientations appear to have an influence on individuals' political affiliation and behaviour in the US (ibid). There are several proposed mechanisms through which religion influences politics. For example, Omelicheva and Ahmed (2018) use a theoretical framework focusing on the influence of religion on political participation. Ibid emphasise four

categories that drive political participation: motive; structure of political opportunities; incentives; and frames. All categories are proposed to be influenced by both religion and other socio-cultural factors. The corresponding religious influences are religious grievances; membership in religious organisations; levels of religiosity; and levels of religiosity and membership in religious organisations (ibid). Ibid's (2018) multivariate analysis indicates religion plays a deterring role upon political engagement and a negligible role on both political behaviour and beliefs – though the evidence they refer to regarding beliefs refers primarily to violence and as such is not necessarily extendable to other behaviours and beliefs.

Religion's influence on political ideology remains a complex question, however. There are clear examples where religious perspectives and political positions on individual issues appear to overlap. Grzymala-Busse (2012) highlights the differences between the relationships between Christianity and conservatism in the US and Europe, where in the latter "otherwise conservative religious Europeans" hold liberal attitudes – in some cases more liberal than their fellow citizens. Ibid emphasises the importance of breaking down the concept of religion into component parts to properly analyse its impacts, as discussed above. The development of various welfare states, unemployment patterns and expenditures across high-income countries has been linked to different religious doctrines highlighting religion's continued influence in state institutions. At the individual level, this relationship is indicated by lower levels of support for social provision amongst religious groups (Scheve & Stasavage, 2006). Evidence also shows that attendance of religious services signals a decrease in class conscious political behaviour (De la O & Rodden, 2008). The mechanisms for religion's influence over politics in these cases are proposed to stem from the belief that charity and community are characteristics of religious institutions rather than the state, in the case of low welfare support, and that religiosity either "substitutes" or "distracts" from economic issues relevant to one's class (Grzymala-Busse, 2012).

Some US literature argues the opposite can be true too; politics can shape religiosity (Margolis, 2018). This may be a particular quirk of the US political system, wherein the republican party has been dominated by a resurgent and explicitly political evangelical right for several decades now. For example, the cultural schism regarding abortion in the United States appears to have

emerged between the intersection of politics and religion. The issue initially held importance amongst Catholics (Williams, 2016), however, its political prominence developed in part based on opposition to the feminist movements of the 1960s and the landmark supreme court ruling in 'Roe V Wade' 1973. Variations between perspectives on abortion exist amongst US Hispanics on denominational lines, wherein Evangelical Protestants are stauncher opponents of abortion than Catholics clearly implies that the relationship between religion and politics in this case is complex (Ellison et al. 2005; Pew Research, 2023). Unfortunately, ibid did not control for political affiliation in their multivariate analysis so it is difficult to assess the differentiated impact of religion and politics in this case. However, the fact that abortion developed as a key issue amongst evangelical protestants in the US over the last century clearly implies that religion is influenced by politics and cultural shifts to some degree.

Values, Beliefs and Attitudes

The contribution of values, beliefs and attitudes to climate change risk perception is an extensive literature field. Throughout this section, several of the notable frameworks will be explored regarding the evidence of their contribution to climate change risk perception, as well as the relationship between measures of values, beliefs and attitudes themselves. These perspectives are considered important to the study of environmentalism and climate change risk perception, as other explanations that by their nature are easier to measure have often not provided the strong evidence base needed to establish consistent reasons for varying risk perception amongst individuals (Carlisle & Smith, 2005; Dunlap & York, 2008). As climate change risk perception has grown amongst high-income countries' populations, the differences between people may likely be found within the "deeply held values and cultural worldviews" that these measures aim to illuminate (ibid). The relationship between values and politicisation becomes apparent when observing support for proposed solutions to climate change e.g. climate justice and circular economies in comparison to green growth and market-based solutions. Beliefs regarding these solutions and their feasibility (or inevitability) may also have an effect on risk perception, showing multiple potential pathways that may be important for a satisfactory explanation.

Postmaterialism

The postmaterial values hypothesis developed by Inglehart (1977; 1990) and Welzel (2005) is a theory of value change wherein the development of postmaterial values is predicated upon the economic wellbeing and stability within a given society. The hypothesis argued that postmaterial values, such as the importance of free speech, popular representation, and self-transcendent concerns, would become more prevalent as economic security increased within high-income countries. Postmaterialism has been relevant to debates regarding environmentalism and climate change for decades, and this can be partly attributed to the fact that environmental issues can be viewed as problematic from both materialist and postmaterialist perspectives (Brechin, 1999; Doran et al. 2019). Inglehart's (1995) emphasis on higher levels of concern in poor countries due to experiences of objective environmental problems is supported by the aforementioned studies citing impact of physical vulnerability and experience of extreme weather, while within high-income countries it is often the case that the affluent middle and upper classes are the most concerned within that population (Mayerl & Best, 2018), although this class effect appears to have dissipated over time (Pampel & Hunter, 2012). These differences may highlight the multidimensional nature of climate change concern cross-culturally, captured by Stern & Dietz' (1994) triad.

These differences may, however, also highlight a weakness in the postmaterial values hypothesis as a universal explanation of environmental concern (Dunlap & York, 2008). Ibid argue that due to the globalisation of environmentalism in both poor and rich countries, postmaterialism as an indicator of environmental concern is a reductive and inaccurate theory, instead forwarding other factors, including direct experience of environmental degradation, resource loss as well as the role of the nation state and nongovernmental actors in "diffusing environmental awareness and activism throughout the world." Finally, ibid note the potential importance of political globalisation through cultural diffusion, education, travel, and mass media consumption. Nonetheless, there is a consistently noted connection between postmaterialism and environmental concern in the literature focusing on high-income countries (Kidd & Lee, 1997; Booth, 2017; Oreg & Katz-Gerro, 2006; cf. Carlisle & Smith, 2005). This led Mayerl and Best (2018) to posit "two worlds of environmentalism", dichotomising its origins in

high- and low-income countries. Indeed, Dunlap and York (2008) concur with this notion, with their critique of postmaterialism acting more as a rebuttal of attempts to universalise explanations that appear relatively unique to high-income countries. This debate will be explored further in the section on socioeconomic status below.

There is some evidence regarding climate change concern specifically that indicates a role for postmaterial values (Tranter, 2011; Tranter & Booth, 2015; Ergun et al. 2024), though further research is required to understand this relationship and confirm the hypothesis's validity. Further, the related "self-transcendence (vs. self-enhancement)" dichotomy, originally proposed by Schwartz (1992), is shown to be significantly impactful upon perceived impacts and concern regarding climate change (Poortinga et al. 2019). While there remains debate as to how correlated Schwartz and Inglehart's value dimensions are (Dobewall & Strack, 2013), these results further the case that postmaterial values remain a factor of interest for research. There are also cases wherein results align "with the expectations of" the postmaterial values hypothesis, where perceived seriousness of global climate change climate change is associated with national wealth (Knight, 2016) and regional income differences mediate how local climate impacts effect political behavior (Hoffman et al. 2022). However, these are not sufficient to prove postmaterial values have an impact. Knight's (2016) comparison between countries based on wealth doesn't break down perceptions according to individual values within each country. Meanwhile Hoffman et al. (2022) utilise environmental concern as a mediating independent variable alongside income to explain green party voting. This emphasises that research focusing on postmaterialism remains potentially fruitful and important to forward this debate.

Postmaterialism is generally measured through a scale of 4 social priorities, ranked in the order that an individual deems important. These are 'maintaining order in the nation, 'giving people more say in government decisions', 'fighting rising prices', 'protecting freedom of speech' (Inglehart & Abramson, 1999). Therefore, the measurement of postmaterialism is likely impacted by historically contingent factors such as the political context, levels of economic instability and inequality, as well as foreign affairs such as wars. Inglehart (2008) indicates that certain impacts are likely to be "short-term", citing the likely negative relationship between

recessions and postmaterial values in a given society, though concedes that recent age cohorts appear to be “slightly less” postmaterialist than middle-aged cohorts, who are the most postmaterialist (ibid). This provides two perspectives on how the level of postmaterialist values may change following events such as economic shocks, as well as longer-term trends such as rising inequality. While the proliferation of postmaterial values is theorised to grow over time, they are expected to drop-off and rebound according to economic shocks and subsequent recoveries (ibid).

Kenny (2020) attempted to observe the prioritisation of environmental provisions in comparison to the economy, following the 2008 Great Recession. Ibid (p949) found that the economic measures used are crucial for identifying the impact upon environmental prioritisation, with both individual-level unemployment and the macro-level unemployment rate both holding significance as indicators of lower environmental prioritisation. Nonetheless, Kenny’s (ibid) usage of prioritisation acts to dichotomise environment with economy, whereas unemployment may not reflect the same drop off in concern. However, evidence from the United States and Europe post-2008 does imply that unemployment is associated with lower levels of climate change concern and higher levels of scepticism (Scruggs & Benegal, 2012), with the authors attributing this to the immediate material concerns taking precedent. While these findings do not explicitly measure postmaterialism, they are closely related in that they implicate measures of economic wellbeing. As such, it may be interesting to observe the strength of postmaterialism as a contributor to climate change risk perception alongside other macro-economic variables such as country wealth, with the goal of identifying the mechanisms driving levels of risk perception, which initially appears to be based upon an indirect influence of postmaterialism, resulting from interrelated economic and cultural factors.

There are very few examples of scholarly attempts to explore variation within those similarly aligned when it comes to postmaterialism, while differing across other sociological categories, such as political ideology. This also goes for how these factors interact with regards to shape environmental/climate perceptions. This makes sense from the perspective that, particularly following the development of the extended 12-point postmaterialism index (Inglehart and Abramson, 1999), postmaterial values per se became more definitionally associated with pro-

environmentalism alongside a number of other issues increasingly seen as 'left wing' such as pro-immigration sentiment. However, this research takes interest in the interaction between politics and postmaterialism, particularly due to the fact that the elements of the 4-point index are far less explicitly orientated towards particular perspectives and may indicate variations between political groups who may similarly prioritise issues such as freedom of speech and popular representation but differ in their general ideological outlook.

Inglehart (ibid) notes that postmaterialist values are "only one aspect of a still broader process of cultural change" away from traditional cultural norms, "especially those that limit individual self-expression". This is an important context from not only the perspective of postmaterialism as opposed to other value categories, as well as distinctions between individuals observed within postmaterial categories, across political ideologies. Therefore, postmaterialism is but one frame through which to view the relationship between values and climate change risk perception. Further research indicates the complexities of value-based approaches to environmental issues including climate change. Crompton and Kasser (2010) emphasise the distinction between self-transcendental and self-enhancement values in terms of their capacity to have either positive or deleterious effects on environmental issues. It is clear that greater alignment with either of these value sets may contribute to varying assessments of risk, in line with the triad of climate concern explored above.

Individualism and Egalitarianism

Alternative value theories are also prevalent in climate change risk analysis discourse. Pidgeon (2012) builds upon the cultural theory of risk (Douglas & Wildavsky, 1982), emphasising that differences between individuals' attitudes towards climate change at the political level "appear to reflect the operation of cultural discourses of 'individualism' and 'egalitarianism'." This is likely reflected in levels of climate change risk perception too, with emerging evidence from several high-income countries indicating that these fundamental values are strong indicators of concern and risk perception (Aasen, 2017; Kahan et al, 2012; Pepper & Leonard, 2016).

This is by no means a straightforward factor to measure. Scholars often differentiate between the types of individualism found within high-income countries, with the United States and

Sweden offering good examples of how forms can vary. The United States' relative lack of welfarist policies and minimal social provision can be, somewhat crudely, paired with a primary adherence to the notion of *laissez faire* liberalism and negative freedom for its citizens (Goodin, 1982). The trade-off of this arrangement being that individuals are expected to sustain themselves without significant support from the state while ideally retaining maximum freedom from state interference. Meanwhile, there is the so-called "paradox at the heart" of Nordic states (Berggren & Trägårdh, 2011), with the historically strongest welfare state provision and relatively high levels of equality. The 'paradox' refers to the high levels of individualism in Sweden, which is referred to as "statist individualism" (ibid). However, this paradox may be explained by the strong welfare policies, which "liberate the individual citizen from all forms of subordination and dependency within the family and in civil society" (ibid). This can be viewed as positive freedom and an alternative to the American form.

New Ecological Paradigm

The New Ecological Paradigm (NEP) is a scale "designed to measure endorsement of an ecological worldview" (Dunlap et al. 2002). A revision of the New Environmental Paradigm (Dunlap & Van Liere, 1978), the NEP includes 15 items within "five discernible, but interrelated, facets of an ecological worldview (Dunlap et al. 2002). The five facets regard attitudes towards ecological crisis(es), limits to growth, 'antianthropocentrism', the fragility of nature's balance and the rejection of exemptionalism (ibid). The NEP, perhaps unsurprisingly, is associated with higher levels of climate change concern and risk perception (Brody et al. 2007; Diakakis et al. 2021), as well as lower levels of scepticism (Whitmarsh, 2011). The NEP has been described as tapping into "primitive beliefs" relating to humanity's relationship with the Earth (ibid), while the authors also indicate the responsiveness of each item "to personal experiences with environmental problems" as well as sources of political and scientific information (ibid). As such, while the scale is explicitly measuring 'attitudes' it relates closely to the values literature in that it seeks to understand foundational beliefs, which are more explicitly environmental.

There is evidence of asymmetric pertinence of the NEP across countries, with Japanese individuals being more closely aligned to it than Americans (Ohe & Ikeda, 2005), with more homogeneity in terms of environmental values in Japan than in America too (ibid). This could

partly be due to the stark polarisation in the United States, with contributing factors to this explored above. Observations regarding levels of homogeneity within countries in terms of climate change perceptions make for interesting point of analysis, as they provide opportunity for a more inductive approach in explaining relationships with factors. While the NEP will not be explicitly explored in this research, its constitutive elements may become relevant within the theory of religion section and following analyses.

Religion and Values

The distinction between religion and values is in some ways difficult to parse, intrinsically linked as they are (Carneiro et al. 2021), with literature focusing on the utility of each category debating whether the analytical distinction needs to be made (Black, 2015). Black (2015) argues that it is the particular function of religious "institutions and vocabulary in which… values can be remembered, discussed and affirmed in emotionally and imaginatively impactful ways" that provide it with its analytical power. Religious narratives and rituals are likely to exert a different form of influence on human behaviour than that of secular values, though there are some elements of major contemporary ideology including nationalism, liberalism and socialism that can be observed as ritualistic (flag-waving and national anthems being particularly evident examples) as well as has having institutional backing from the state and civil society in many regards. This highlights clear and interesting intersections between religion, values and politics. However, the noted analytical distinctions as well as the ongoing importance of religious and political identities to the individuals who prescribe to them are sufficient for indicating that they are all useful in isolation for an analysis into individuals' perceptions and behaviours.

Research focused on the intersection of religion and values on sustainability specifically has emerged over the last few years in particular, with an understanding that the predominant focus on secular values systems may not provide an accurate perspective on cultural influences on sustainability (Ives & Kidwell, 2019). Beginning more broadly, empirical evidence from Europe indicates that religion still plays a key role in shaping values, specifically those in Schwartz' *Human Values Scale,* though this relationship is complex (Schnabel and Grötsch, 2015). Ibid's (2015) results show that engagement in religious practices and participation in church services are important positive indicators for values including traditionalism, conformity

and security, while stated religiosity is less influential. Meanwhile, hedonism is negatively associated with these factors. This justifies arguments regarding the usefulness of a multidimensional approach to measuring religion.

Schnabel and Grötsch (2015) also don't find substantive difference between "denominations" of religion, though only include non-religious, Catholics, Protestants and others. This is reminiscent of Nietzsche's (2003) death of God and the continuation of Christian morality's hegemony, even in apparently secular European countries, in this case manifesting on individual perspectives. This could help to explain cultural similarities between people in individual countries despite varying religious affiliations. This emphasises the value of cross-national research and utilisation of aggregate level measures as it not only provides an opportunity to analyse the differences within each country, but also the influence of national contexts upon apparently distinct categories of religious affiliation. This research will aim to analyse countries across the world with different religious majorities and minorities, and as such the differences between various religion may be more pronounced and offer an opportunity to develop theory regarding distinct cultural-religious contexts upon climate change perceptions.

The causal flow between religion and values is debated in a limited set of literature too, with evidence of relationships flowing in both directions (Chan et al. 2020; Sibley & Bulbulia, 2014). Chan et al. (2020) state simply "it is unclear whether it is because certain values predispose one to becoming and staying religious or whether religious persons are more likely to adopt those values." What is clear however, is the evidence of the relationship, with ibid's sample of Chinese citizens highlighting differences between Christians and nonbelievers on all 10 values in the Schwartz model explored above. A potentially important finding attained through ibid's (p86) longitudinal design it that individual Christian identity predicts increases in tradition and decreases in self-direction, hedonism, and security over time. This could evidence a role for religion in changes in values, though the study also indicates strong evidence for other variables simultaneously influencing both values and religion.

Referring specifically to environmental values, Ives and Kidwell (2019) argue "simply equating religion with certain sets of values does not adequately capture the more complex interplay of religious belief, belonging, and environmental values." The question as to why specific religious beliefs or values systems emerge in certain contexts is particularly tricky, because of the number of potential contributing factors. Social psychology literature emphasises the influence of culture and ecology upon value formation (ibid), and this could extend to contemporary religious practice in some way too. It is also important to consider those who become religious later in life. Although this is likely a smaller proportion of the population than those who are raised within religious households and communities, it is far more likely here that values orientation could play a role in shaping individual religiosity, though this could once again be explained by other factors.

Further examples highlight the complex relationship between religion and values. The rapid increase in support for gay marriage in many countries over the last few decades, despite protests coming primarily from religious groups, has led to changes in messaging from many religious institutions including the church of England. While many arguments for gay marriage were reframed to be more in keeping with religious messaging, this emphasises that socio-political values can clear influence religious individuals and institutions in both belief and practice. This is but one example throughout history of religion's capacity to develop and adapt to the process of social change and emphasises the likelihood that a reinforcing relationship between religious and social values is likely present within some countries (Ives et al. 2024).

Personal and Collective Efficacy

Personal Efficacy, or "perceived instrumentality" (Spence et al. 2011), refers to the impact that an individual believes they can have upon the issue of climate change. Collective efficacy refers to the impact that an individual believes they and others around them can have, within either their locality, country or globally depending upon the questions asked. From the perspective of climate change risk perception, the literature does show that belief that one can make a difference does indicate higher risk perception (Brody et al. 2007; Kellstedt et al. 2008; Capstick & Pidgeon, 2014). Belief that one can make a difference is a broad conceptualisation, which may capture several behaviours an individual can engage in to meet this subjective criterion,

such as individual behavioural changes including limiting their use of a car and air travel, which are objectively beneficial for reducing emissions, as well as actions like recycling, which while associated with environmentalism more broadly, don't necessarily contribute to lower emissions[3]. Further, engagement in politics and activism could also lead to higher levels of perceived instrumentality, regardless of its impact upon public policy and discourse. Nonetheless, as personal and collective efficacy are measures of subjectivity, for the purposes of this research, the objective impact is secondary to the discussion of individual perceptions.

Evidence shows that direct actions undertaken is impacted by both personal and collective efficacy (Wang, 2018; Bostrom et al. 2019), as well as "outcome expectancies" (Gregersen et al, 2021). The fact that objective behaviours undertaken are likely impacted by socio-psychological characteristics, which can be used to predict individual subjectivities, also emphasises the role that they may play in different levels of risk perception. However, this relationship is complex, due to the causal questions regarding which aspects of individual subjectivity act as primary orientating factors for other elements of subjectivity. For example, collective efficacy itself is predicted by future orientation, norms, and utilitarian motivation (Wang, 2018), which relate to values – to be explored later in this review. Furthermore, there are "objective" structural constraints placed upon an individual in changing their behaviour, socioeconomic and demographic differences in "access" for example, which may also impact perceptions of personal and collective instrumentality (Tanner, 1999). A combination of these individual level and structural factors may help explain why a majority of individuals in high-income countries say they say they are "doing all they can" to mitigate climate change in their daily life (EIB, 2022), while the efforts of both nations and individuals remain lacking according to the IPCC (United Nations, 2021).

It is possible that the relationship between these factors may have a reverse causal explanation, with higher risk perception increasing the likelihood of perceived instrumentality due to cognitive biases in the form of "motivated reasoning"[4] (Druckman & McGrath, 2019). Put

[3] Paper, for example, requires significant amounts of energy to recycle, which still relies upon the use of fossil fuels and energy grid in the UK, leading to more emissions (UCL, 2020).
[4] This concept is closely related to assimilation and confirmation bias, explored below.

simply, motivated reasoning refers to when an individual's value and emotional preferences affect their beliefs, rather than the other way around (Epley & Gilovich, 2016). A relevant example in this case relates to car ownership, with car owners showing lower levels of concern (Poortinga et al. 2011). Belief that one's actions have little to no impact on the environment could well boost car ownership, with lower levels of perceived instrumentality leading to this portion of the population expressing lower levels of risk perception. Inversely, the shame that one may feel for continued use of a car with adequate knowledge of their personal emissions contribution, or high perceived instrumentality, may motivate individuals' justifications for continued use of cars through lower expressed risk perception. This relationship could be mutually reinforcing too, with high levels of risk perception motivating high levels of perceived efficacy, and this increased cognitive weight placed upon one's actions acting to increase risk perception. Collective efficacy could emphasise social expectations, expressed by and perceived as placed on an individual, and could further reinforce risk perception through either social solidarity or perceived lack of action from others.

There is evidence longitudinal evidence that high risk perception influences perceived efficacy (Valkengoed et al. 2023), though, this does not coincide with likelihood to implement adaptation behaviours. This indicates that motivated reasoning acts to reduce cognitive dissonance for individuals with either high or low levels of climate change risk perception leading to correspondingly high or low levels of perceived instrumentality. Nonetheless, while this would be expected to explain a majority of individuals, there will likely be a number of individuals who go against this explanation, those with high risk perception and low personal efficacy for example, who may themselves be impacted by a different form of motivated reasoning (Bayes & Druckman, 2021), discussed more extensively in the section above.

Proximity to Climate Change

Proximity to climate change in this case is a subjective measure, referring to how people perceive climate change as an issue that will impact them, their families, community, etc. It is therefore appropriate to understand proximity from the perspective of psychological distance. These concepts are particularly relevant to climate change as despite its objective status as a meta-issue that will impact all areas of human life, individual subjectivities can vary hugely, in

part due to the variations in 'psychological distance' between themselves and the issue itself. Scholars have theorised 4 dimensions of psychological distance that may explain varying levels of risk perception: "spatial, temporal, social and uncertainty" (Spence et al. 2012). These forms of psychological distance can be measured in multiple ways. For example, spatial distance may occur for individuals living in relatively stable climates with little or no experience of extreme weather. Temporal distance is perceptual expectations regarding the effects of climate change being 'far away' and is likely in part bolstered by spatial distance. Social distance can refer to a multitude of factors, including close social groups engagement with the issue, political affiliation, and sociodemographic factors.

As such, proximity to climate change in the social-psychological sense is theorised less as a direct contributor to climate change risk perception, but the mediator through which the whole range of personal experiences may mold individual subjectivities. It offers a useful frame through which the various factors below are likely to introduce feelings proximity to the issue, which may manifest in different levels of risk perception depending upon the interactions of all these factors.

Physical Vulnerability, experience of extreme weather and subjective attribution

The objective weather conditions that an individual experiences in their local environment is often posited as a contributor to climate change risk perception, and research shows that it is very likely a factor for extreme weather events such as heat waves, storms, floods and droughts (Kvaløy et al. 2012; Shao & Goidel, 2016; Bergquist et al. 2019; Sloggy et al. 2021; cf. Brody et al. 2007; Reser et al. 2014; Frondel et al. 2017; Hoffman et al. 2022). However, as Ogunbunde et al. (2019) note, due to the fact that many think of climate change and extreme weather as distinct issues, extreme weather does not necessarily impact climate change perceptions (Chabin & Pasanen, 2024). Therefore, when considering the impact of objective conditions upon individual perceptions, it is important to understand the mechanisms at play in both the objective and subjective domains, and how the factors can interplay to produce varied levels of risk perception.

Weiner et al. (2013) show that psychological distance and subjective proximity to environmental risk can vary significantly within individual countries, based upon factors such as residential location. Ibid (2013) focus on individuals "living in proximity to risk hazard", which they call a 'risk signal', finding that individuals become significantly more worried about climate change the closer their proximity to a hazard. Interestingly, this study uses a nuclear facility, and results show decreased risk tolerance regarding issues of both climate change and natural disasters. This implies strongly that individuals who have "constant" signaling of environmental risk factors may become more conscious of both environmental and climate issues, and that these need not be directly related to the issues themselves, as is the case with nuclear energy. However, it is also likely the case the different risk signals, for example an oil refinery or low-lying coast will have asymmetric impacts on perceived risk from these issues too.

The asymmetric nature of weather events across varying geographies indicates another important spatial dimension to this complex socio-psychological problem too. Brody et al. (2007) argue that as most Americans have historically associated climate change with rising sea levels it is unsurprising that those closest to the coast indicated higher risk perception. However, proximity alone may not be a sufficient factor in all cases, with evidence from Norway indicating that direct personal experience of events such as floods and landslides is necessary for affecting an individual's risk perception, while "merely living in a more exposed area" with no personal experience of a hazard has little to no impact (Lujala et al. 2015). This indicates that proximity alone can influence varying levels of risk perception but also depends upon other factors such as the quality of the threat itself and knowledge of climate impacts. Nonetheless, these differences could also arise from varying social and values factors, relating to the triad of concern (Stern & Dietz, 1994), depending upon levels of social cohesion, egalitarianism and individualism (Aasen, 2017).

In fact, a level of caution regarding these proximity and physical vulnerability factors is clearly warranted. Bruine de Bruin and Dugan (2022) find that severe weather experience is not significant in Oceania and Europe, while it is in all other continents, indicating significant spatial variation globally. This would appear to contradict the evidence cited above, although the difference between measuring continents and individual countries may be the reason for this

apparent contradiction. Nonetheless, the inconclusive evidence across different countries emphasises that there is further need for research to establish both national level evidence regarding the impact of experience of extreme weather and spatial proximity, as well as theoretical perspectives on why differences appear to exist between countries that have been researched.

Further caveats regarding the importance of temporal considerations, for example when weather events happened, or whether it is a change based upon a trend rather than a single disaster, have also been made relevant in research into the impact of experience of extreme weather upon risk perception. Hughes et al. (2020) focused upon both "recent experiences of elevated temperature" as well as "longer-term" temperature increases in Australia, finding that the longer-term increases are the only of the two to indicate associated with increases in climate change risk perception, though small. Ibid (2020) also show that this increase in risk perception is found following experience of higher levels of rainfall deficiency compared to the historical average. As such these results would imply, when it comes to the 'invisible' impacts of climate change, the longer-term changes in, for example temperature, will have a larger impact on risk perception in comparison to a few days of higher temperature. Once again, this may differ across countries depending upon how 'exceptional' these higher temperatures are perceived to be.

The evidence cited above indicates strongly that the quality of the weather event, with regards to temporal, spatial and tangible characteristics, will have differentiated impacts upon levels of risk perception amongst individuals. It follows from this evidence that proximity to the potential and material impact of climate change, experience of extreme weather and subjective attribution of weather events to climate change all play a very important role in shaping individual perceptions of risk (Diakakis et al. 2021). These factors can be further influenced by political, ideological, and socioeconomic factors, as shown in Ogunbunde et al's (2019) path analysis relating to flooding experience in the UK. It is also important to note that as these studies originate from different countries at different times, the overall levels of risk perception are likely to be different between examples, meaning the impact of these variables may also have changed over time in their importance as explanatory contributors to risk perception.

Media

Media consumption is often a significant indicator of climate change risk perception. In the UK, readers of right-wing newspapers are consistently found to be less concerned about climate change. In the United States, where TV media is more influential and polarised, Fox News viewers are consistently the least concerned about climate change (Carmichael et al. 2017), though this may be primarily impacted by partisan divides which "in turn influences media coverage," then influencing public opinion (ibid). Although, path analyses indicates that media coverage "directly affects the level of public concern" (Carmichael & Bruelle, 2017) depending upon quantity of coverage. Across Europe, sceptical right-wing populist media is argued to amplify the scepticism of right-wing populist parties, effecting their voters through ideological diffusion (Duijndam & van Beukering, 2021). In Japan, media has been found to have a significant yet short-term impact on public concern (Sampei & Aoyuagi-Usui, 2009). The variations across countries in terms of how polarised their media is both generally and on the issue of climate change is likely to be the determining factor as to whether differences between individuals in terms of media consumption proves significant. The US, UK and Australia all have extremely polarised popular media sources, for example. Coverage breakdowns across each country analysed will be necessary to sufficiently explore the impact of media.

Whether people choose their paper depending upon their pre-determined positions or are primarily influenced by the information they consume is a complex causal question that contributes to the difficulty for researchers to directly attribute media influence on individual perceptions. However, the technical nature of the issue of climate change and its relatively recent prominence in political and media discourse, as well its generally lower priority amongst most individuals[5], indicates that the media may be particularly influential on this issue, with media sources using their "agenda-setting function" within an ideological frame to persuade individuals into a particular position (Gavin, 2009). However, due to the overwhelming empirical evidence in favour of climate change and its increasingly visceral effects, sceptical media coverage has shifted in many countries (Carvalho & Burgess, 2005) indicating ideological

[5] with some evidence of shifts towards higher prioritsation (Ritchie, 2024)

convergence towards increasingly dominant cultural sentiments on the part of media organisations. Furthermore, quantity of coverage signals increased concern in longitudinal studies (Bruelle et al. 2012; Carmichael & Bruelle, 2017; Capstick et al. 2015), regardless of whether the coverage is framed sceptically, meaning its increase prevalence across media organisations will indicate higher levels of concern.

Sociodemographic

Age

Age is often found to have a significant impact on risk perception in most studies, with young individuals tending to be the most concerned, with a decrease in risk perception the older the person is (Whitmarsh, 2011; Echavarren et al. 2019), though regional and country breakdowns indicate this is not generalisable across all high-income countries (Poortinga et al. 2019; Driscoll, 2019). This is generally reflected over time regarding environmentalism broadly, with cohort changes leading to higher levels of support for environmental spending overall throughout the 20th and 21st centuries (Pampel & Hunter, 2012). Kvaløy et al. (2012) find that the relationship is curvilinear, with ages 30-60 being generally more concerned than the very young or the very old (Scruggs & Benegal, 2012). This is an example where the measures used by different authors can incur different understandings of that which is being measured, and it is important to make these explicit in the discussion of results.

Nonetheless, a consistent finding across all studies referenced so far is the lowest levels of risk perception amongst the oldest individuals in society. Reasons put forward include the higher levels of scepticism amongst this generation (Whitmarsh, 2011), which understandably signals that they would be less concerned, as well as conservatism which is another indicator of lower risk perception as shown above. Another perspective places weight on the egoistic consideration from Stern & Dietz' (1994) triad of concern, with the likelihood that one will experience devastating consequences of climate change decreasing the older one gets perhaps leading to lower levels of expressed risk perception[6]. However, this perspective would rely on a

[6] This had led to climate communication literature to emphasise 'Legacy Thinking' as a potential tactic to boost older individuals' engagement (Frumkin, et al. 2012).

populace of individuals who understand the threats associated with climate change and remain unconcerned, while Whitmarsh's emphasis on scepticism appears to logically follow. A potential explanation comes from longitudinal US evidence, where age has declined in influence (along with all other sociodemographic measures) as party identification and political ideology have become far more influential (Driscoll, 2019). The influence of increasing politicisation of climate change in the US appears to be a consistent theme and may explain the decline in other variables influence over time.

Swim et al. (2022) have attempted to research generational differences in the feelings associated with climate change beyond concern, such as worry, anger, disgust, guilt, hope and interest. Ibid's results show that negative emotions relating to climate change have increased primarily amongst the youngest generations (iGens & Millennials), though worry has increased significantly across all generations. Interestingly, baby boomers were the most likely to discuss climate change, followed by the silent generation (ibid). Meanwhile, guilt over climate change has only increased amongst the iGens and Millennials. This is interesting as it implies higher feelings of personal responsibility amongst younger generations, while evidencing a lack of discussion amongst peers. It is possible that the affectual measures, which indicate significant differences between generations, may play a role in the varying levels of overall risk perception amongst these different generations, highlighting the potential for research understanding the relative importance of each affectual measure.

Gifford and Nilsson (2014) explore general environmental concern, showing that older individuals tend to be less concerned in this case too, corroborated by other studies (Mayerl & Best, 2018; Klineberg et al. 1998). Gifford and Nilsson (2014) reference Honnold's (1984) study that aimed to look at the direct effect of aging on environmental concern, labelled an age effect, and how political climates change over time, in this case becoming more conservative[7], labelled a period effect. Honnold (1984) concludes that the period effect appears to explain trends in environmental concern over age effects amongst older age groups, while younger

[7] This study was undertaken in the US during the early 80s, a context wherein conservative President Ronald Reagan was exceptionally popular.

groups indicate a greater role for the age effect. Meanwhile, Johnson and Schwadel (2018)'s longitudinal study into environmental spending support in the US support Honnold's findings regarding the impact of age effects and while not engaging with period effect measures directly, do emphasise the potential impact of polarisation in the 1990s as a driver of differences. Furthermore, Johnson and Schwadel (2018) indicate that cohort replacement provides little explanatory power in the US, and this particular debate will be returned to during the section on income.

Sex/ Gender

Scholars emphasise a 'gender gap' regarding climate change risk perception, with women normally shown to have higher levels of risk perception and concern than men (Bord & O'Connor, 1997; Bruine de Bruine et al. 2014; Hamilton, 2011; Dabla-Norris et al. 2023; Ergun et al. 2024; Davidson & Freudenburg, 1996). Sociological understandings focusing on women's socialisation as caregivers indicating that the affective elements of risk perception may have a prevalent role in driving the observed higher levels, though there may be room for neurological and biological understandings too (Christov-Moore, 2016). Interestingly, this would also imply that women are more likely to view climate change from the social-altruistic perspective within Stern & Dietz' (1994) triad. Indeed, in a study specifically focusing on the impact of gender on environmental concern, Dietz et al. (2002) found that women and men differed significantly on only one value priority, that being altruism, "with women reporting a substantially higher priority for this value than men." They continue to argue that this difference may explain the qualities of climate change concern, including that for "other humans, other species, and the biosphere" (ibid).

The interplay of other variables, which vary according to gender, on climate change risk perception also pose interesting questions with regards to determinants of risk perception. Young women tend to identify with left-wing parties more than men (Shorrocks, 2018) and are increasingly achieving higher levels of education attainment (Hek et al. 2016). On the other hand, the "conservative white male (CWM) effect" highlights the individual characteristics most likely to express scepticism of climate change and lack of concern (McCright & Dunlap, 2011), indicating a dichotomy based on political, racial, and gendered lines, at least in the US. This

highlights that the potential contributors to the gender gap are numerous and causally it remains in question which factors lead to the prevalence of others, and which are mutually reinforcing but separate.

Joireman and Lui's (2014) study aims to understand the impact of gender as a primary predictor variable. Ibid forward a theoretical model that places emphasis on Strathman et al.'s (1994) consideration of future consequences (CFC) scale as a potential moderator for the impact of gender on willingness to pay (WTP) for climate change. The CFC scale measures the degree to which individuals factor concern the future into their decision making. Willingness to pay for climate change indicates areas where individuals would be willing to contribute financially (through consumption taxes or taxation for government action) to causes aimed at mitigating and/or adapting to climate change. High levels of CFC indicate more support for climate mitigation policies (Joireman & Lui, 2014; Dietz et al. 2007), however, the impact of CFC varies between men and women[8]. Higher levels of CFC among women make them the most likely segment of the population analysed to be willing to pay for climate change (Joireman & Lui, 2014). However, lower levels of CFC actually show a reversed effect of gender on both political affiliation and willingness to pay, meaning men with low CFC have higher levels of liberal politics and WTP than women with low CFC (ibid). This is important as it implies that gendered differences do not linearly predict engagement with climate change, possibly including risk perception, and that there is opportunity to observe each factor with regards to how much explanatory power they hold.

Education

Education can be measured through different means, including educational attainment, years in education, and so on specific skills gained. These are important to distinguish as they do not always provide equal measures through which we can measure the impact of education in general. According to Knight (2016), globally "average years of schooling" has a positive relationship with climate change "awareness, perceived human cause, and perceived risk",

[8] It should be noted that the authors find no evidence of a significant impact of gender upon CFC itself, making it an appropriate measure to act as a moderator (Joireman & Liu, 2014).

though Poortinga et al. (2019) and Ergun et al. (2024) find in Europe that, while "perceived impact" and risk perception is significantly impacted by education, concern is not (cf. Running, 2013). Level of education is shown to be relevant as well due to the general importance of scientific literacy and critical understandings of the veracity of certain forms of evidence (Whitmarsh, 2011; Clements, 2012). Further, education has been shown to have a variable impact on the levels of postmaterialism, with differences between countries being substantial (Novy et al. 2017). This emphasises its role is multidimensional and may impact the effects of other contributors on climate change risk perception in meaningful ways.

In the UK, the level of education achieved does not linearly predict lower scepticism, and concern appears to only be significantly different between those who didn't finish high-school compared to those who did (Bruine de Bruin & Dugan, 2022; Hoekstra et al. 2024) and those with graduate-level qualifications (Johnston and Deeming, 2016). On the other hand, concern regarding extreme weather events in themselves is not significantly impacted by educational attainment (Bruine de Bruin & Dugan, 2022). This clearly implies that understanding climate change as a scientific issue, and critical engagement with media surrounding it, may be partly predicated on higher levels of education, while general environmental concerns regarding individual extreme weather are more ubiquitous across society.

This likely varies according to the country analysed, however. Evidence from the United States indicates that higher levels of scientific literacy are associated with an increased effect for the political and cultural polarisation regarding climate change noted above (Kahan et al. 2012; Hamilton, 2011). "Hierarchical individualists", generally independently aligned but leaning Republican in the US, become less concerned with climate change with higher levels of scientific and numeric literacy, while "communitarian egalitarians" (Democrat leaning independents) have a smaller yet notable increase in concern with higher levels of scientific and numeric literacy (ibid). The fact that these cultural cognitive/ ideological factors override characteristics in the US indicates that there may be interesting qualitative differences in other

countries too, though likely not as stark. Overall, though, the US seems to be rather unique[9], with results across continents indicating higher levels of risk perception amongst those with higher levels of education, which as the authors note suggests "that scientific literacy and… interest may increase climate change concerns" (Bruine de Bruin & Dugan, 2022; Aasen, 2017). While cognitive cognition and political affiliation are not directly aligned, the lesser degree of politicisation in other high-income countries may help to explain their apparent differences with the US.

Income and Class

Maslow's (1943) theory of human motivation posits that individual concerns are hierarchical, wherein the basic necessities of survival, i.e. physiological and safety concerns, take primacy in an environment where these needs are in some way insecure. In feeling a level of security for these requirements, individuals may then become concerned with less immediate human needs such as social belonging, status, freedom, and self-actualisation (ibid). While this may appear an unusual framing through which to explore high-income countries, it is important to note that economic security within high-income countries varies significantly, with levels of economic inequality in the US and UK being significantly higher than in continental Europe. The growth of food bank usage, fuel poverty, and homelessness (Trussell Trust, 2021) indicates that for many individuals and families, physiological concerns pertaining to adequate nutrition and shelter are likely everyday considerations. For said individuals, it may be the case that such issues take precedence over the conceptually distant issue of climate change.

Nonetheless, it is possible that considerations of material security characterised by those above may intensify or reinforce risk perception regarding physical vulnerability to climate change. This understanding is drawn from the global environmentalism hypothesis, wherein individuals in poor countries, due to their more regular exposure to environmental hazards are more likely

[9] Although, North American's climate concern is also significantly impacted by education (Bruine de Bruin, 2022). This could be down to several factors. Firstly, the inclusion of Canada may have skewed the results. Secondly, the number of Republicans with college degrees is significantly lower than the population average, and as such while their education may be less impactful in determining their climate change concern, as a portion of the entire US and North American population, they likely represent a very small fraction.

to develop environmental concern (Dunlap & York, 2008). However, when it comes to climate change as noted, the importance of education regarding the aggregated impacts of climate change and subjective attribution of individual weather events to climate change may complicate such a directly experiential and materialist explanation. As such, risk perception in this case likely depends upon perceptions regarding the immediacy of climate change's material impacts and may vary depending upon spatial proximity to environmental hazards too. Therefore, it is unlikely that the line between climate change risk perception and socioeconomic wellbeing is as simple as it appears regarding general environmental concern.

Evidence regarding the role of income and wealth highlights that these factors are not significant indicators of climate change risk perception (Hornsey & Pearson, 2024) and that their influence has declined over time, along with the other sociodemographic measures explored thus far (Driscoll, 2019). Pampel and Hunter (2012) highlight a non-linear relationship between socioeconomics and environmentalism between cohorts (age and education), that also indicates a decreasing role for socioeconomic status (SES) over time. Earlier generations appear to support the perspective of postmaterial theory that wealthier individuals are most likely to engage with environmental issues, and over time these values will diffuse to those of lower SES (Nawrotzki, 2013). However, more recent age cohorts support the perspectives forwarded by global environmentalism, that lower SES individuals have high environmental concern "because of the greater exposure to environmental degradation (ibid). Nonetheless, studies specifically looking at climate change within the frame of cohort change remain lacking, so one must be careful not to extrapolate too much from the above studies.

This not only raises interesting questions regarding the sociodemographic measures relating to climate change risk perception, and how they might differ relative to general environmental risk perception, but also relates to the influence of postmaterialism in high-income countries, with the possibility that environmental issues are viewed increasingly as threats to material security rather than more abstract 'higher-level' concerns such as self-transcendence and enhancement.

2.1.3 Systemic Level Contributors to Climate Change Risk Perception

Religion

There are very few studies analysing religion as a country-level measure in the context of environmental and climate perceptions. As such, the empirical evidence explored here is limited but sets out the context for the gap that this research will be exploring. Nie (2019) explored the perceived self-efficacy of multiple countries using proportions of conservative protestants and Catholics. Ibid indicate that perceived self-efficacy was lower in countries with high conservative Protestantism, applying to both conservative protestants themselves as well as the rest of the population. Meanwhile, a high proportion of Catholics is linked to higher self-efficacy. This emphasises the role of religion as an influence upon a country's entire population, rather than just its individual adherents, perhaps stemming from institutional capture and socio-cultural influence. Therefore, it may be valuable to explore religion from different levels of analysis in order to understand how it functions as a contributor to climate change risk perception, even if these impacts are relatively minor.

Sharma et al. (2019) indicate that countries with more religious populations tend to adopt less stringent climate change policies, with controls for GDP per capita. This is a country-level analysis and therefore doesn't provide much in the way of variations between religious affiliations. Skirbekk et al. (2020b) argue that countries "that are more religious may behave differently as they develop", with lower levels of energy use per capita in Hindu-majority countries, and lower climate adaptive capacity in Muslim and Hindu majority countries. Ibid argue this could vary due to risk perception. This is interesting as it implies that majority religious affiliation may affect the influence of GDP on climate related measures, as well as vice versa. In Christian majority countries, the effect of majority religion affiliation is not significant though the overall percentage religious individuals is negatively correlated to energy use and GDP per capita (Skirbekk et al. 2020a). Therefore, both majority religion and general religious affiliation indicate differences with these country-level measures. These links indicate that it is possible that variations in development and energy use may vary according to dominant religious ideologies, meaning it could be an important conceptual link for understanding future efforts to deal with climate change.

Chuvieco et al. (2016) explored the impact of religion in a multilevel analysis with several country-level indicators for religion. Using majority religion, including atheist/agnostic for countries where this is the largest religious demographic, and percentage of Christians, ibid show that countries with majorities of atheist/agnostic individuals score highest on environmental performance indicators, followed by Christian countries in second. However, with the inclusion of control variables including HDI and GDP, the religious affiliation variables lose a majority of their explanatory power (Ibid, 2016). Chuvieco et al. (2016) reject White's thesis on the basis of their findings, with the indication that Christian countries indicate higher EPI scores than all other majority religions across countries. Therefore, literature pertaining to both individual-level and country-level religion indicates that religion often has positive effects on environmental attitudes and action, though this depends upon the measure utilised. This will be explored in relation to climate change risk perception specifically, a concept with characteristics distinct from many other environmental issues, with the expectation that religion's effects will vary substantially from those relating to the broader environment due to evidence from climate change literature and the theoretical framework expounded upon in a later section.

GDP

GDP per capita is a commonly used country-level variable across environmental and climate perceptions literature. GDP per capita is calculated by the by the overall value of all goods and services produced in a country and is presented as how much that equals per individual person within that country – not accounting for individual inequalities. Its emergence in academic discussion regarding environmental perceptions originated in *the affluence hypothesis* regarding general environmental concern (Inglehart, 1995; Diekmann & Franzen, 1999), which first emphasised the relationship between GDP and environmentalism. Alternative measures for capturing national influence include the Human Development Index (HDI), which has been explored with regards to its impact on climate change risk/ threat perception (Hornsey and Pearson, 2024).

It is vital to differentiate between GDP as a longitudinal measure within countries and as a measure between countries. For example, longitudinal studies of the United States have

indicated that changes in GDP are significant over time as an indicator of risk perception (Carmichael & Brulle, 2017), whereas within European countries there is no significant relationship (Duijndam & Beukering, 2021). However, for this study the between-country variable is the primary factor of interest. In this case, evidence across literature is inconclusive, with some studies showing that higher GDP indicates higher levels of climate change concern (Duijndam & Beukering, 2021 Knight, 2016) and risk perception (Ergun et al. 2024), while other studies have also indicated that it is not significant (Kvaløy et al. 2012; Lee et al. 2015). There are also examples showing a significant negative correlation between countries and perceived risk (Lo & Chow, 2015; Sandvik, 2008). Echavarren et al. (2019) show a significant positive relationship when individual level and objective environmental measures are included, which then loses its significance in the full model including political factors such as extent of environmental policy and political freedoms.

Reasons for these inconsistencies are likely down to a few factors. As aforementioned, Lo and Chow (2015) indicated the different conceptualisations of climate change concern, perceived importance, and perceived danger, lead to different results, citing Sandvik's (2008) for a more generalised conception of concern and the potential for misinterpretation of results without clear definition of the type of concern being analysed. In this case they find a positive relationship between perceived importance and GDP, and a negative relationship between perceived danger and GDP in rich countries (ibid). Furthermore, the differences in results may be dependent upon the countries (Marquart-Pyatt, 2012) and variables utilised in each study. Studies using European countries only (Echavarren et al. 2019; Duijndam & Beukering, 2021) indicate positive roles for GDP on risk perception, though the caveat for Echavarren et al. noted above must be kept in mind. Meanwhile, all global studies listed above show either no significant relationship or a negative one. Likely more impactful though, is the usage of different variables that are likely to explain the different levels of risk perception/ concern better than GDP. Echavarren et al. (2019) indicates that environmental policy and civic freedoms may have such an effect, as evidenced between the differences between the two models.

GDP and ideology

There are also pertinent questions regarding how ideological factors vary depending upon country wealth. This has been explored somewhat with regards to how religiosity and the effect religion varies in this regard. Skirbekk et al. (2020a) analysed the relationship between country-level majority religious affiliation and factors including GDP, emissions and energy use. They indicate that both the proportion of individuals associated with the majority religion and the number of religious people of any religion in a country are "negatively and significantly" correlated with GDP per capita, emissions and energy use. This indicates that there are more religious individuals in low GDP countries, and that energy use and emissions are lower in these countries too. Further, Chuvieco et al. (2016) controlled for GDP in their research regarding religion and environmental performance indicators. Ibid's results indicate that GDP is a very important indicator of environmental performance and reduces the effect of religious affiliation when controlled for.

There are few identified studies exploring the relationship between political ideology and wealth, though this may be discussed more in fields outside of environmental/climate risk perception. Ergun et al. (2024) explore climate change risk perception, including measures such as GDP and interest in politics. However, ibid did not explore the relationship between the two factors. Ibid did show that controlling for ex-communist countries in Europe influences the effect of GDP, reducing the strength of the GDP coefficient on climate change risk perception, though did not explicitly explore the interactions between these two variables. This thesis aims to explicitly analyse variations of ideological categories based upon country wealth, with this specific aim to identify the differences in how political ideology effects risk perception across countries based on GDP per capita, and how this impacts climate change risk perception. In consideration of the two worlds of environmentalism (Mayerl & Best, 2018), which proposed differences between conceptualisations of environmentalism in rich and poor countries, the question remains whether political ideologies i.e. left, right and centre also vary in their risk perception between richer and poorer countries.

As shown, there remains little research on the relationship between GDP and political and religious ideology. This research will aim to bridge this gap somewhat, providing an

understanding of political ideology as well as the impact of religiosity at both individual and country-levels across countries of differing levels of wealth.

Climate Policy

The extent of a country's climate policy implementation is a country-level measure that may provide a different perspective regarding the influence politics and political affiliation on climate change risk perception, as well as an interesting area to analyse differences between welfare regimes and welfare policies. This could be measured temporally in terms of when the policies were implemented, in terms of sheer quantity of climate policy passed, and how far the policies go in addressing the problem of climate change. There are also potentially important differences between the types of policy implemented in terms of 'pull' versus 'push' measures (Drews & van den Bergh, 2016), with generally more popular measures like subsidies having potentially asymmetric impact on risk perception compared to regulations and taxes. Evidence indicates the reverse relationship too, wherein climate change risk perception strongly indicates support for climate policies. In Finland, support for 7 policy instruments including carbon taxes, renewable subsidies and coal bans were all indicated strong positive relationships with climate change risk perception (Sivonen, 2022). These considerations make climate policy a fairly difficult indicator to measure, meaning empirical evidence is not too extensive. Although theoretically it is very plausible that policies influence climate change risk perception.

Echavarren et al. (2019) provide measures of climate policy performance for each country, from 'very low' to 'high'. Ibid's (p818) results indicate that countries who perform worst on climate change within Europe tend to have the highest risk perception, with 'low' and 'medium' performers showing significantly lower risk perception linearly. This is interesting as it implies that publics are in some way counterposed to their governments in terms of policy performance. It may also imply that national level performance may influence individual perceptions of how the rest of the world is performing too, though this is speculation at this point. Meanwhile, interaction effects between policy performance and country-level extreme weather indicate statistically significant yet very uneven results. For example, faster temperature rises with higher policy performance indicates far higher risk perception than very low performance, while medium policy performance indicates far lower risk perception than

very low performance. Similarly high performance and drought indicates far higher risk perception than in very low performance countries, while this is lower in low and medium performing countries. These interactions are interesting, and it would be interesting to observe whether weather events in an individual's locality also interact with policy in this regard.

Contextual effects are important to consider here too. A landmark piece of legislation i.e. the major climate bill recently codified in the US under President Biden (Cabral & Sherman, 2022), could prove to have a galvanizing effect on public opinion or a boomerang effect upon political opponents (Gregersen, 2020). The effects could impact levels of risk perception amongst individuals with particular educational, class and very likely politically affiliation more than others, with other factors including media framing of the legislation also being important, as shown in Finland (Vikström et al. 2023). Biden's legislation is interesting specifically too, as it includes provisions relevant to both welfare and climate change including redistribution and healthcare, with subsidies for electric vehicles effectively acting as both welfare and climate policy. The interaction between welfare policies and climate policies on individual-level outcomes is an under-researched area that this research will aim to analyse throughout. Often viewed as in-tension with one another, due to the welfare states' historical reliance on growth, it will be interesting to observe differences at the individual-level based upon practical implementation of the two traditionally separated policy areas across countries, with Biden's policy offering an example of a more harmonious manifestation.

Emissions

Literature pertaining to this research's interest in the influence of individual-level experience of climate change impacts on risk perception has been explored above. The potential influence of a country-level measure such as emissions on risk perception offers an alternative indicator which if influential on individuals' risk perception would hold several different implications. Firstly, it would be signalled through reliance on carbon heavy industry as well as cultural discourses surrounding energy production and usage, rather than any visible environmental degradation (Spence et al. 2011; Pohjolainen et al. 2021). It could also be impacted by factors such as the proportion of threatened jobs within the carbon heavy industries, a common thread used by climate sceptics in the US. There are not many studies that utilise country-level

emissions as a measure. Running (2013) finds a significant positive relationship with the WVS 2005-08 data for how serious people consider climate change, though this hasn't been replicated in studies since, which have primarily determined the relationship to be weak (Mostafa, 2016). Lo & Chow (2015) find a significant negative relationship between per capita CO2 emissions and risk perception. This once again highlights the importance of differentiating between conceptualisations of concern and/or risk perception.

More recently, Pohjolainen et al. (2021) find no significant impact on individual perceptions including concern from national carbon emissions, though with the caveat that this may have changed (since 2016) with the recent upsurge in public concern and support for significant climate action on an institutional level. Nonetheless, the expectation for this research is that country-level emissions will not be significantly related to climate change risk perception, and this is primarily due to the lack of visceral indicator of emissions beyond individual coal plants for example and a potential subjective attribution to air pollution amongst some individuals. Further, the expectation of cultural discourses surrounding energy use and production would likely require a very informed population and/or one that is heavily reliant upon carbon intensive industry. Pohjolainen et al.'s (2021) caveat could be prescient, however, with countries such as Australia – one of the highest per capita emitters – appearing to be extensively engaged in the issue of climate change in recent history, with an increase from 56% to 83% expressing concern since 2011 and demands for government action signalled by the general election (IPSOS, 2022).

2.1.4 Conclusion

Altogether, this literature review has covered contributors to climate change risk perception that will be primary to the research questions posed moving forward, explicitly identified the gaps in the literature that these questions will explore, as well as identified important variables that will either act as control variables or will not be explored in this research, primarily due to data limitations and project scope. The discrepancies across studies in terms of the contributors' effects on risk perception will be explored in the context of two forms of climate risk perception – country and world risk perception. These concepts offer two perspectives through which individuals may identify and assess climate change. The subsequent two

sections, 2.2 and 2.3, explore the country profiles relevant to the countries used in first analysis (Chapter 5), and the theory of religion relevant to the second analysis (Chapter 6), respectively.

Political Behaviour and Ideology are shown to be important factors contributing to climate change risk perception. This effect is most apparent in the United States, where party affiliation is a primary predictor of climate change risk perception. Evidence across Europe and other high-income countries indicate an effect across ideological affiliation, with left-wing individuals tending to have the highest risk perception, with liberals often following closely or not being significantly different in certain cases. Meanwhile, right wing and far right individuals have the lowest. Country specific caveats are necessary, especially when exploring the interactions between politics and other factors such as religion, with the example of protestant US democrats having far lower risk perception than non-religious ones, becoming more in line with Republicans (Arbuckle, 2017). Questions also remain as to whether other factors influence politics' effect on climate change risk perception, such as attendance of religious services and postmaterialism. This moderation will be explored within Chapter 4 for the analysis of Finland, Japan and the United States as well as Chapter 6 for the analysis included 28 countries. The latter will also aim at understanding the differences between countries once country-level measures are included. There is little evidence regarding the role of either country wealth or majority religion as a mechanism shaping political affiliation, which is one gap this research will explore in detail.

Religion is another ideological category of particular interest, with evidence showing that perspectives vary across different religions and denominations, as well as an individual's adherence to religious principles and practices. The specific environmental/climate measure used appears to have a substantial impact on how religions effects emerge. Therefore, this research will aim to explore climate change risk perception thoroughly, with the inclusion of a theory section (section 2.3) outlining the pathways through which religion contributes to this measure. As this research covers many countries, it offers an opportunity to view not only differences between religious individuals but also countries' religious majorities and the different manifestations of a religion across the world. Expectations for the effects of religion, as well as the elements which underly it, are explored in detail during the theory section.

Chapter 5 then tests the expectations from the theory as extensively as possible with the chosen data.

Values literature also indicates a significant role for measures, including egalitarianism, future orientation, and NEP. The relationship between postmaterialism and climate change risk perception has been questioned primarily from the perspective of its lack of suitability as a universalised explanation of environmentalism. This thesis will explore the contribution of postmaterialism in detail, how its effects vary across countries as well as how it interacts with political ideology, in order to explore the constituent elements of the postmaterialism index and inquire as to whether it may offer utility in capturing contemporary cultural and political trends. Chapter 6 includes this discussion alongside other mechanisms associated with politics.

Perceived personal and collective efficacy are measures that are consistently shown in the literature to have a strong relationship with climate change risk perception, with higher levels of personal and collective efficacy indicating higher levels of climate change risk perception. Underlying socio-psychological characteristics are likely vital for understanding varying subjectivities across and within societies, and an interplay with the values and religion literature explored above is an interesting perspective incorporated into the theory of religion. Sociodemographics have also been shown to have substantial coverage across the literature, with consistent evidence shown that both gender and age shape climate change risk perception, though the latter's relationship is somewhat complicated by technicalities in measurements. As other measures have been identified and introduced, the gendered effect appears to have lost much of its explanatory power. Education appears to be an important factor too, particularly higher education, while the importance of income has decreased over time.

Factors not included in this research include exposure to extreme weather, subjective attribution as well as media. Nonetheless, the literature indicates gaps worthy of exploration in future research. Evidence highlights an asymmetrical role for extreme weather experiences on climate change risk perception, with some inconsistencies across findings depending upon the country(s) analysed and the measures used. The literature therefore signals that continued

analysis could prove pertinent in illuminating the relationship between extreme weather experience and risk perception. The role of media is difficult to explore, particularly with regards to its position as an ideological tool from a cross-national perspective. However, this ideological perspective is ripe for exploration with regards to climate change risk perception.

2.2 Country Profiles

2.2.1 Introduction

This section introduces the empirical evidence regarding the countries analysed in the first analysis chapter: Finland, Japan and the USA. Each country profile will begin with a general outlook of the environmental and climate records of each country, with literature introduced explaining the origins of the environmental movements and explore the general perceptions of the individuals in each country. Following this, sections on religion, politics and postmaterialism are included, with analysis of the characteristics of each country in general, continuing into an exploration of how these issues have impacted environmental and climate attitudes and policies in each country. The evidence from each country will contribute to the theoretical expectations of the research to follow as well as providing important context for the 3-country analysis in section 4.

2.2.2 Finland – religion, politics and values and their relationship with environmentalism

Environment

Finland has experienced similar trends to other high-income Western societies throughout the past few centuries with significant development post-WWII, though their industrialisation started later than the Western European countries (Our World in Data, 2023). Finland's 2021 per capita CO2 emissions were 6.8 tonnes (ibid), which is low compared to other high-income countries[1].

The contemporary environmental movement in Finland is argued to have begun primarily due to the scientific evidence from Sweden of environmental degradation from toxic chemicals, having led to Finland beginning its own research into the matter (Räsänen, 2012). This timeframe coincides with many high-income Western nations, wherein during this period environmental issues become more prominent. Contemporary environmental and climate policy in Finland is some of the most ambitious in the world, as stated, aiming to be the first high-income country to reach net-zero by 2035.

Rucht's (1999) categorisation of eighteen countries on the bases of elements of environmental politics is somewhat illuminating regarding Finland's historic political success. Ibid ranks Finland

as strong when it comes to environmental policy efforts and environmental movement pressure, medium for individual attitudes and changes in environmental quality, and weak for green parties. These have developed somewhat, with Green League members in the national cabinet in 2002 and then coalition government in 2007 and 2019. In terms of recent policy developments, the SGI (2022) ranks Finland's environmental policies as 4th in the world.

However, greenhouse gas emissions did rise in 2018 meaning its position on climate was weakened relative to other environmental issues. Pál et al. (2023) argue that the common perception of 'greenness' associated with the Nordic countries including Finland, is fundamentally flawed, with its sustainable development having been built primarily upon heavy utilisation of natural resources at the expense of the ecosystem. Nonetheless, Finland met its greenhouse gas emission reduction commitments between the period 2013 to 2020 (Tilastokeskus, 2022b) and as such from climate change perspective has been relatively successful, at the expense of other environmental goals.

Religion

Eurostat (2011) indicated that Finland is one of the most homogenous countries in Europe in terms of culture, ethnicity, and religion, though this has changed somewhat due to both an increase in individuals identifying as non-religious and Muslim immigration and refugees in the last few decades (Taira, 2017).

Hjelm (2020) shows that according to Chaves and Cann's six-point scale, the Evangelical Lutheran Church of Finland (ELCF) is an established state church – scoring highest amongst 18 countries in terms of how much the state privileges one or more denominations. Indeed, in terms of individual religious identification, Evangelical Lutheran/ Protestantism makes up the large majority. Hjelm nonetheless indicates alternative theological scholarship that posits the notion the ELCF being a "national, or a "folk church"" rather than a state church. Hjelm (2020) explores this conceptual ambiguity relating to the church and its relationship with the Finnish state, citing an older statement from the church itself which is illustrative of the relationship:

"Finland does not have a state church system, but the church can be called a folk church. The church and state cooperate in many ways. [. . .] [The Church] is an integral part of the people's

history and culture. A majority of Finns belong to the church. The church's ceremonies, from baptism to funerals, and its customs are part of the Finnish tradition."

Social statistics provide some of the context regarding this ambiguous position. While a majority of Finns continue to identify as Evangelical Lutheran, the number of church memberships is greater than this, indicating a cultural and traditional element to continued membership in the church, beyond simple religiosity (Taira, 2017). Further, amongst those who self-identify as Evangelical Lutheran, there is a significant proportion who state they do not believe in the Christian God, showing that this cultural/traditional factor may play a role in religious identification too (ibid). Meanwhile, membership and self-identification with the ELCF and Evangelical Lutheranism are on a steady decline according to longitudinal analysis (Kotiranta, 2015).

The introduction of environmental ethics into religious and values-based education in Finland may be an important factor for explaining Finland's consideration of environmental issues as important. In line with the shifting religious landscape within Finland, religious education has become increasingly geared towards multicultural and diverse practices; "Since 2003, religious education has been 'religious education according to one's own religion', allowing space for secular/non-religious students to learn through a class on ethics (Aarnia-Linnavuori, 2013). Although, Rissanen & Poulter (2023) emphasise the continued role for the majoritarian perspective, which is potentially problematically reframed as universal and neutral. Within this framework, environmental education has been introduced through the adoption of Palmer's model which includes education "*about, in* and *for* the environment" (ibid). In contrast to the broader ideological foundations of environmentalism in Christian societies, contemporary textbooks, Christian and secular, focus on stewardship ethics which includes humanities 'duty' to protect God's creation (ibid). Nonetheless, the primary content is narrative and factual text.

It is difficult to connect Finnish Christianity to any particular conception of the environment. Due to the secularisation of Finland's political sphere and general attitudes of its population it does not appear that arguments made from explicit religious positions are particularly prominent in Finnish society. This contrasts significantly with the USA, which is shown in its

country profile below. This indicates that the intersections of politics and religion, along with their impact on environmentalism, are complex, with the influence of religious doctrine being dependent on factors such as secularisation and political culture. Nonetheless, Moilanen (2010) emphasises that the broad conceptualisation of Christianity as an anthropocentric religion proposed by White (1967) has also influenced Finnish conceptions of environmentalism towards this perspective. It is expected that this broad theological doctrine, while potentially impactful from a historical and institutional perspective, is unlikely to influence individual attitudes in Finland to a substantial degree, with forces of secularisation in education, politics and culture likely influencing contemporary conceptions.

Politics

Finland is a parliamentary representative democracy with proportionate representation for its voting system. Coalition governments are the norm, with no party achieving over 30% of the vote share in its modern political history (Tilastokeskus, 2022a). Finland is ranked 2nd in the SGI (2022) robust democracy ranking, following Sweden. As with many Western high-income countries, Finland has observed growth for populist parties on both the left and right, as well as a Green party. Most recent governments have been centre-left with the former government in 2019 being comprised of the Social Democratic Party, Centre Party, Green League, Left Alliance and the Swedish People's Party (SPP). This government set the ambitious target to reach net-zero by 2035 – which would make it the first high-income country to do so. In the 2023 election, the True Finns, a right-wing populist party who are relatively ambivalent about the issue of Climate Change came 2nd, its strongest election to date. It is in coalition with the National Coalition Party, the SPP and the Christian Democrats. This could signal a significant shift in Finland's environmental/climate policy and/or attitudes.

Postmaterialism

Helve (2023) explores differences between young Finnish Millennials and young Generation X in terms of values, through analysis of data gathered from periods where these respondents were between 16-24. Willingness to lower living standards to decrease pollution was generally met with affirmation from both generations, though value types were both materialist and

postmaterialist (ibid). Ibid uses this to dispute Inglehart and Welzel's (2010) modernisation thesis, as the development of the economic sphere has not coincided with continued cultural evolution towards postmaterialist values and democracy. Helve (2023) argues in favour of Inglehart's scarcity hypothesis, wherein times of economic turmoil and scarcity can lead to a bolstering of materialist values, once again caveating, however, that both Gen X and Millennials continued to state preference for environmental protection even if it meant declining living standards during these periods. Ibid (2023) argues therefore that the findings for both generations in Finland "validate a postmodern phenomenon" regarding the increasing individualisation of "value worlds". This brings into question totalising narratives relating to social attitudes, which will be interesting to explore for the other countries.

2.2.3 Japan – religion, politics and values and their relationship with environmentalism

Environment

Japan developed very quickly following World War 2, with an exponential increase in emissions in the mid-1950s, following a very similar trend to Western European nations including Finland (Our World in Data, 2023). Japan's per capita CO_2 emissions as of 2021 was 8.6 tonnes, sitting just below the average (ibid). The SGI ranks Japan 20th out of 41 on its sustainable policies.

The demographic of post-Fukushima social movements was characterised primarily by postmaterialist and left-libertarian values (Satoh, 2021). Ibid emphasises this is common in advanced capitalist democracies such as Japan, referencing Kitschelt's argument regarding the changes in social cleavages from the traditional left/right and libertarian/authoritarian cleavages towards integrated concerns of labour and libertarian. In this sense Japan has followed a similar trajectory to Western advanced economies, though the differences in cultural, religious and political foundations provide interesting space for the cross-country comparison in this research.

Picken (1994) argues there is a large emphasis on individual moral cultivation in Japanese society with less emphasis on structural deficiencies compared to the "defective attitudes" of individuals[3]. This may correspond to a greater role for attitudinal measures in Japan when explaining variations in climate change risk perception.

Religion

Kimpara (2015) argues that Japanese society reflects an ambivalent feeling towards religion" that is vital to understanding Japan's social, political and legal context. ISSP (2023) data indicates the largest religious affiliation in Japan is non-religious, representing just under 2/3rds of the population, followed by Buddhism (30.38%) and Shintoism (2.68%). Indeed, the Japanese General Social Survey (JGSS) in 2005 showed amongst all prefectures only 10.56% claim they "have a religion… they personally believe" with the term religion itself mostly viewed "in a pejorative sense" (Nelson, 2012). However, the Statistics Bureau of Japan (SBJ, 2019; Scroope, 2021) shows 69% practice Shinto, 66.7% practice Buddhism, 1.5% practice Christianity and 62.% practice other religions. This emphasises the distinction between conceptualisation of religion as an ideological belief system and its role in social and cultural practice.

Kimpara (2015) emphasises the "dual meaning" of religion in Japan. Firstly, as a guide or solution to human issues – to which a majority of the Japanese population reject being identified with. The second meaning, which can broadly be described as cultural refers to engagement in social activities relating to religious traditions. Indeed, it is not unusual for Japanese individuals to engage with culturally significant practices across multiple religions. This explains how the total number cited by the SBJ exceeds 100%. The potential impact of this form of religious syncretism may lead to Japanese individuals varying very little based on religion. However, it is also the case that those who explicitly identify with a particular religion may nonetheless have beliefs particular to that religion.

Shintoism offers an interesting case regarding the position of religion in Japanese society post-WW2. The present constitution adopted in 1947 includes provisions for religious freedom and the separation of church and state, partly in response to the oppression of religious communities under the former state Shinto system as well as its support for ultra-nationalism and militarism in pre-war Japan. Accordingly, many adherents claim that Shintoism is less of a religion in the sense of dogmatic belief system and more of a cultural tradition; "its insights "perceived" before they are "believed", its basic concepts "felt" rather than "thought"" (Picken, 1994) . Nonetheless, ibid argues that Shinto remains the "*weltbild*" or concept of the world, for the Japanese population. Several Shinto and Buddhist concepts refer directly to the

environment and humanity's relationship with it. Animism and Nature Worship are important concepts in both traditions (ibid).

Nonetheless, Bichter (2023) argues that representing Japan as a nation based on these traditions prior to Western influence is simplistic, with development having significant negative ecological impact in pre-modern and modern Japan. Ibid caveats that the "adoption of Western technology" released the potential for large-scale environmental impact, though the desire to catch up to western high-income nations evidences the contrast to the broader cultural traditions of Japan (Bichler, 2023). Dessì (2013) argues that Japanese Buddhism, has become gradually "more engaged in environmentalism" in the contemporary setting, perhaps due to the scale of the contemporary ecological challenge, with limited success. Furthermore, Dessì (ibid) argues that Buddhism, in particular Zen Buddhism, has had a large influence on global environmentalism through the deep ecology movement, and as such it may be hard to differentiate this global influence from the influence of Buddhism and Shinto within Japan specifically. The question then is if this cultural and religious foundation can be shown to have had influence on Japanese environmental and climate policy, and whether it substantially influences the attitudes of individuals in this country in particular.

The extent of secularisation in Japan is a long-running debate. As mentioned, the post-WWII constitutional overhaul did mean Shinto receded somewhat from Japanese governance with a more pluralist paradigm emerging, not just in terms of number of religions but also in terms of individual religious ideology too (Nelson, 2012). High and Supreme Court rulings have cited this and "a widespread "religious indifference"" as logic for the bolstering of this post-war precedent (ibid). Therefore, with institutions reflecting the public indifference towards individual religious belief, Japan can be said to have secularised. However, the continued alignment of Japanese individuals with cultural or familial religiosity will naturally exert a level of influence on practices if not individual belief. Nonetheless, it is expected that religion will play little role in Japanese citizen's perspective on environment and climate, with the evidence that individual attitudinal measures are crucial to understanding their perspective on these issues.

Politics

Japan is a representative democracy featuring a semi-proportional voting system. National elections have historically been dominated by the Liberal Democracy Party since the 1950s, enjoying "almost unbroken power to the present day" (Nilsson-Wright & Wallace, 2022). Ibid argue that Japanese democracy is "remarkably stable", and that populism has not gained the momentum is has in many high-income nations/ democracies. However, the SGI ranks Japan 35th out of 41 in terms of the robustness of its democratic institutions.

Japan has observed less of a populist shift that has been characteristic of western countries, particularly post-2008 financial crisis, though this is somewhat contested depending upon definition of populism utilised. Japanese politics has historically been bureaucratically dominated, wherein an entrenched vested interest structure produces a "genuine iron triangle of politics, bureaucracy and industry" (Moe, 2012). However, an increasingly demanding populace and 'populist-lite' rhetoric from figures such as former LDP prime minster Shinzo Abe is indicative of a shift, albeit not as stark as those observed in Europe and the US (Fahey et al. 2021; Allinson, 2011). Direct popular appeals, particularly on issues of defence and rearmament in the face of China's unprecedented rise to a world superpower, have increased the power of the prime minister and undermined the historically dominant bureaucratic state (Ramirez, 2018).

The restructuring of political institutions has not produced radically different climate politics in Japan, and this may be due to the less politicised nature of climate change in the country, relative to Western countries including the US, discussed below. There is little evidence of scepticism in media (Sampei & Aoyagi-Usui, 2009) or amongst political elites. This indicates a significant area of contrast to Western European and North American coverage of climate change, wherein politicisation and media scepticism has incurred substantial divides in public perceptions amongst individuals in these countries.

A common focus in literature relating to Japanese environmental politics is the religious movement Soka Gakkai and its affiliation political party KOMEITO. Soka Gakkai, while having foundations in Buddhist teaching, was "excommunicated by the authority of the Buddhist sect"

in 1991, making it a separate and "new religion" (Kimpara, 2015). Its environmental stance is generally in-line with Buddhist teachings, with the related NGO Soka Gakkai International having worked with the UN on ecological projects. Its president also emphasises the necessity for a shift towards "a 'contribute way of life' akin to Buddhist interdependence [of humans and nature] (Dessì, 2013). However, KOMEITO and Soka Gakkai have a less obvious stance on global climate change, with its explicit commitment to decarbonisation being less ambitious than current Japanese policy goals (Cothern & Hasegawa, 2023). Nonetheless, the party and movement remain small, relative to the entire electorate, so it is expected that these perceptions are not likely to drastically effect Japanese climate change perceptions.

Postmaterialism

Taniguchi (2006) engaged in mixed-methods analysis of over 33,000 newspaper editorials between 1945 to 2000 showing a clear postmaterialist shift during this period. Ibid (2006) argues this provides confirmation of the value-change thesis and the scarcity hypothesis, both of which are explained in the Finland country profile. Taniguichi (ibid) also indicates that Inglehart's socialisation hypothesis, "the basic values of a person reflect the socioeconomic conditions that prevailed during his or her pre-adult years", also holds for Japan during this time. Ibid rejects the notion of the postmaterialist measurement becoming "increasingly indistinguishable from a random selection of values", argued by Davis and Davenport (1999) amongst others, and reflecting the argument forwarded by Helve (2023) in the above Finland country profile regarding the postmodern shift towards individualisation of value worlds. Taniguichi (2006) argues that this is contradicted by the World Values Survey data and Japan specific editorials, at least for Japan.

Lee and Fujita (2011) show a gradual increase for the acceptance of libertarian values in Japan, which they link explicitly to postmaterialist values, focusing on the social roles of women, and the importance of lineage, harmony and custom to decision making. Attitudes regarding the role of women has seen the most significant change, with a 30% swing towards non-traditional roles for women. Ibid argue that the pace of this change would likely have been even faster should the rate of cohort change have not slowed, with Japan's aging population. In fact, ibid contend that while intra-cohort change may have been initially primary in the postmaterialist

shift due to the rapid modernisation of Japan post-WWII, the main motivator for social change now is the more gradual process of cohort replacement. Lee and Fujita also emphasise increasing individualism amongst Japanese citizens, which coincide with the development of postmaterialist and libertarian values in Japan. This is interesting as theoretically it would magnify the cultural emphasis on individual moral cultivation forwarded by Picken[4].

Japan is also a useful case regarding the potential western-centric bias that metrics such as postmaterialism may represent. While Japan has seen a growth of postmaterialist values post-WWII, the influence of western economies, specifically the USA, in its post-war resurgence and development was an unprecedented economic intervention (Varoufakis, 2011). The cultural exchange was likewise substantial, with Japanese citizens consuming more US media than all other non-western countries around the world, other than Israel (Ishii, 2012). Furthermore, Japanese TV commercials have emphasised "Western, particularly American, ideals" (ibid, 2012). Therefore, the dual processes of globalisation (of the economic sphere) and rationalisation (of the cultural sphere) (Weber, 1992) may have contributed to a level of western cultural influence in Japan that would make it an exception amongst east-Asian countries, at least prior to the latter's economic development a few decades later. As such, postmaterial values in Japan may not represent the justification for the metric that it initially appears to. Indeed, Chen et al. (2022) show that postmaterialism is relatively low in China, despite unprecedented economic growth, while evidence from Hong Kong indicates a growth in postmaterialist values amongst its youth (Wong, 2009). Therefore, the level of economic and cultural exchange as well as historical relationships are likely to influence the degree to which postmaterialism is likely to develop within a population. Alternatively, the delay due to cohort change may also explain the lower postmaterialism in China so future research is necessary to confirm the mechanisms shaping value change (Inglehart, 2018).

2.2.4 United States - religion, politics and values and their relationship with environmentalism

Environment

While a majority of Americans believe in anthropogenic climate change and supporting taking steps to carbon neutrality by 2050 (Tyson et al. 2022), progress on climate change has been

very slow relative to other Western high-income nations. The United States' per capita emissions as of 2021 was 14.9 tonnes making it one of the world's biggest emitters of greenhouse gases[5], with the SGI ranking the US 40th out of 41 countries on its environmental policies.

Due to the lack of progress in congress, the executive branch under Democratic Presidents has attempted to act on Climate Change through executive orders and agencies, such as the Obama administration's Clean Power Plan. However, policies such as this are subject to court oversight and in this case the policy was deemed unconstitutional due to the EPA having acted outside of the remit of the Clean Air Act originally passed by congress. A similar constitutional issue has arisen following the Trump administrations' environmental rollbacks at the start of the president's 2nd term (Noor, 2025). In this sense, the US system of checks and balances has significantly impacted its capacity to enact effective climate change policy while also coinciding with historical instability in rhetoric and policy output due to the contrasting priorities of each administration.

Religion

The USA has a large Christian majority, around 48% are protestant and just over 20% are Catholic. There is a quickly changing religious landscape, however, with a 27% drop in affiliation with the Christian religion and a 24% rise in non-affiliation in the last 50 years (Pew Research Center, 2022).

The US constitution was the first written constitution to establish a strict separation of church and state, doing so through the first amendment ratified in 1791: "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof." Nonetheless, public displays of religiosity in the public sphere by political actors are commonplace in the United States, with advocacy for primary political issues such as abortion and drug criminalisation emerging from the intersection of religion and politics (Williams, 2016), with the former often being advocated against on the basis of religious belief in contemporary US society. There is evidence of this becoming more prevalent, with contemporary leaders using "religion for partisan gain in a manner distinct from those who came before" (Domke & Coe,

2008). Ibid argue that religion has become a weapon in US politics, with President Trump's weaponization of Christian fundamentalism in advocacy for his supreme court nominations being particularly representative of this (Turtle & Bloomer, 2022).

Zaleha and Szasz (2015) show that the anti-environmentalism central to the Christian Conservatives political campaigning has made explicit reference to the biblical principle of stewardship, partly in response to White's (1967) thesis regarding the influence of Judeo-Christian theology on Western countries/individuals' relationship with the environment. However, this varies amongst denominations. Southern Baptists (the largest protestant denomination in the US) amongst other Protestant denominations have indicated that there is a misinterpretation of stewardship at the heart of modern environmentalism which approaches idolatry akin to neo-pagan nature worship (Zaleha & Sazas, 2015). This theological perspective is reflected in the higher levels of skepticism amongst conservative Christians regarding climate change.

In terms of the process of secularisation in the US, historically the country has been observed as an outlier and counterexample to the secularisation thesis due to the continued high levels of religious affiliation amongst its population. Contemporarily, Voas and Chaves (2016) argue that this is no longer the case, with successive cohort becoming less religious overall than those that preceded them. However, while there is certainly a decline in religiosity in the US, it is likely still important in the contemporary setting in terms of both levels of religious affiliation and institutional influence. The influence of the religious wing of the Republican party has been covered substantially amongst scholars. Lewis (2019) argues that while the Christian right has moderated on some aspects, its overall impact has been to evangelise the party, with changes in rhetoric, attributable to its influence, amongst national candidates on issues of "abortion, gay rights, and religious freedom". Meanwhile, individual religious leaders including "the late Jerry Falwell and Pat Robertson" appear to exert direct influence upon state politics that they might not achieve at the national level (Conger, 2010). More broadly, Glass (2019) critiques the assumption of increasingly secularised institutions within the US amongst scholars, arguing contemporary conservative religious affiliations have become deeply aligned with "nativist, anti-intellectual populism".

Politics

The US is a representative democracy with a state based majoritarian voting system for its congress and its presidential elections. Its system is technically pluralist though is in essence a 2-party system with dominance held between the Democratic and Republican parties. The SGI ranks the US 15th out of 41 in terms of the robustness of its democratic institutions, while the attack on the Capitol building on January 6, 2021, following the 2020 Presidential election highlighted the tensions at the heart of US democracy.

The US Congress' legislative procedure is particularly prone to so-called 'roadblocks' with minority parties having several methods of disrupting policy agendas, especially in the senate, with the slim majority usually held by governing parties (Gailmard & Jenkins, 2008). This stagnant political environment may have the effect of exacerbating the fraught political debates in the USA wherein, as shown below, the public often find agreement on issues such as climate change, as well as elements of gun control and abortion that are often considered to be the most divisive issues. This highlights the complicated institutional difficulties that the US faces in enacting climate change policy and perhaps why it remains a climate 'laggard' amongst most other OECD countries.

Postmaterialism

The USA provides arguably the most comprehensive longitudinal case study regarding the development of postmaterialist values, due to its early economic development and economic strength post-WWII as well as the economic turbulence characteristic of advanced economies post-Bretton Woods. Indeed, the USA provides evidence that period effects can lead to changes in levels of postmaterialist values in both directions, with millennials higher levels of materialism compared to older generations being attributed to the 2008 economic crisis and crises that followed (Twenge et al. 2012). Nonetheless, the US still has high levels of postmaterialism in relative to other countries (Jordaan & Dima, 2019), as is normal with advanced economies, and millennials score higher on the postmaterialism index than older cohorts, showing this period effect does not reverse the trend of cohorts becoming more postmaterialist over time in this case (Booth, 2017).

Booth (2017) shows the link between postmaterialism and environmentalism in the United States, indicating that as postmaterialism has increased so too has environmentalism quite consistently. Ibid indicates that the inclusion of political measures does impact this, as is expected in the US where political affiliation is a particularly strong indicator of environmental/climate attitudes. This appears to have changed over time, with earlier studies indicating no meaningful attitudinal differences between postmaterialists and materialists when it comes to environmental attitudes, while there was evidence of differences in terms of political ideology and partisanship (Davis, 2000). Climate change became a hyper-partisan issue in the years following Al Gore's documentary 'An Inconvenient Truth', due to this and factors such as elite cues from both liberal and conservative leaders, so this may explain some of this difference (Merkley & Stecula, 2021). Nonetheless, postmaterialism does not intercorrelate strongly with a particular political ideology and as such this explanation is not sufficient. This requires more research that considers changes over time carefully.

2.2.5 Rationale for the 3 countries

The 3 countries chosen for the analysis outlined above offer range of distinct characteristics across the areas that represent the focus of the upcoming analyses, while also having some similarities in these areas, as well as high levels of economic development. The countries were chosen on the basis of their capacities for meaningful comparison whilst at the same time enabling further theorisation relating to the prior literature review and theory sections. The USA and Finland, are both, broadly defined, high-income, western democracies with high levels of Christian affiliation. Nonetheless, differences in how religion and politics manifest and operate within these two systems are highly distinctive.

Finland, despite its high-levels of Christian affiliation is highly secularised with belief in God being far lower and education having moved away from an emphasis on any one religion. Politically, Finland is a pluralistic society with a proportional political system which has generally manifested in coalition governments and high levels of deliberation amongst its political parties. The USA differs substantially from both political and religious perspectives. America's population is amongst the most religious across high-income countries, with religion playing a significant role across political and civil society, despite its codification as a secular society. The

US has a highly fractured political system, with high levels of political and regional polarisation. Subsequent administrations often have vastly diverging ideologies and bipartisan legislation is an increasing rarity. Furthermore, the two countries differ in terms of the distribution of wealth, with the USA being one of the most unequal high-income countries in the world, once again emphasising that their broadly similar characteristics on a global level do not correspond with qualitative aspects of each country's make-up.

Japan represents another high-income democracy, with deviations in political and religious characteristics, particularly the latter. Japan was seen as an ideal country for the development of the analyses and theory, offering somewhat of a middle-ground between Finland and the USA in terms of politics; Japan is a majoritarian democracy but has generally been dominated by one party and has not been subject to the high levels of polarisation observed in the USA. Japan's religious characteristics were the primary reason for its inclusion, offering a unique religious history and contemporary demographic make-up, with Buddhism and Shintoism shaping its contemporary culture and society, which allowed for further understanding and development of the theory of religion.

Therefore, the countries are considered to be particularly suited to the subject of this analysis without introducing too much extraneous country level variation for the purposes of this first exploratory study. A summary of the characteristics of the countries are included in table 2.1 below. The table offers summaries of each section from the country profiles in section 2.2.

Table 2.1 – Characteristics of the three profiled countries – Finland, Japan and the USA

Country	Finland	Japan	USA
Environment	- Late industrialiser, rapid development post-WWII - Per capita CO_2 emissions (2021): 6.8 tonnes - Ambitious climate target: net-zero by 2035 - Strong policy ranking (4th globally, SGI 2022) - Environmental success sometimes at cost of biodiversity	- Fast post-WWII industrial growth - Per capita CO_2 emissions (2021): 8.6 tonnes - Ranked 20th globally (SGI) - Less politicised discourse - Strong role of moral cultivation in environmental attitudes	- High emissions: 14.9 tonnes per capita (2021) - Ranked 40th out of 41 in SGI environmental policy - Partisan gridlock stalls climate policy - Executive action (e.g., Obama's Clean Power Plan) undermined by courts - Checks and balances impede consistent policy progress - Climate policy shifts with administration
Politics	- Proportional democracy; coalition governments - Strong democratic institutions (2nd in SGI) - Green League part of multiple coalitions - Climate targets set by centre-left gov't; recent rightward shift may challenge this	- Dominated by LDP since 1950s - Stable, less populist politics - Democratic institutions weaker (35th in SGI) - Climate change less politicised, limited media scepticism - Religious-linked party (KOMEITO) minor influence	- Presidential system; 2-party dominance (Democratic & Republican) - SGI ranks US 15th in democratic institutions - Highly polarised; January 6th Capitol riot reflects democratic tension - Filibusters and partisan divisions block legislative progress - Climate change highly politicised; policy change unstable between administrations
Religion	- Dominated by Evangelical Lutheran Church (ELCF), but secularising rapidly - Religion plays cultural/traditional role - Environmental ethics in education reflect stewardship models - Religious influence on environmentalism minimal	- Culturally religious (Shinto/Buddhist) but majority identify as non-religious - Religious practice more cultural than doctrinal - Shinto and Buddhism value nature (e.g., animism), but unclear policy influence - Religion not central to environmental attitudes	- Large Christian population (48% Protestant, 20% Catholic) - Secularisation increasing; rise in non-affiliation - First Amendment separates church and state, but religion prominent in public/political life - Religion used for partisan gain (Domke & Coe, 2008) - Conservative Christians

			resist climate action, citing stewardship theology - Religious right influential in GOP; climate scepticism tied to religious-political identity
Postmaterialism	- Evidence of both - Individualisation of value systems (Helve, 2023) - Willingness to sacrifice living standards for environment across generations	- Strong post-WWII postmaterialist shift (Taniguchi, 2006) - Growing libertarian and individualist values - Contemporary cultural ties with the West may influence postmaterialism - Cohort replacement central to value change	- High postmaterialism due to early development - Millennials show more materialist values post-2008 crisis (Twenge et al., 2012) - Cohorts generally becoming more postmaterialist (Booth, 2017) - Environmentalism rises with postmaterialism - Climate views shaped more by political affiliation than values alone - Issue has become hyper-partisan post-2000s (Merkley & Stecula, 2021)
Sociodemographics	- Population: ~5.6 million - High education levels - Homogeneous population, but growing diversity - Strong welfare state - High GDP per capita, low inequality	- Population: ~123 million - Aging rapidly, world's highest proportion of elderly - Highly urbanised and homogeneous society - High education levels - Economic stagnation with rising inequality	- Population: ~335 million - Diverse and multicultural - Aging, but younger population than Japan - Significant urban-rural divide - High education disparities - High inequality and moderate welfare provision

The identified characteristics are also relatively suitable for the themes explored throughout the 28-country analysis, with the set of countries being split between predominantly Christian and Buddhist majority countries (besides India). This analysis also extends to low-income countries, however, analysis of differences in country wealth was considered more suitable for the larger set of countries. Finally, the 3-country analysis was partly guided by the partial release of the data that was made necessary due to the COVID-19 pandemic, further outlined in section 3.3.8 of the methodology section.

2.3 Theoretical Expectations for the relationship between religion and climate change risk perception

The literature regarding the impact of religion is quite limited, as shown throughout the literature review in section 2.1. Following this introduction to the subject, this theoretical section aims to provide some in-depth theoretical expectations as to how religion and its constituent parts impact climate change risk perception. This is included as a separate section due to its aim to guide the upcoming analyses (in particular the 2nd analysis in Chapter 5) while also providing a novel and specific contribution to future research, which may aim to explore the relationship between climate change and religion. In general, this theory section aims to account for the potential asymmetric influence of religion on climate change risk perception in cross-country analyses.

2.3.1 Developing Theory

The purpose of this section is to underline expected mechanisms through which religions can influence environmental and climate risk perception. As stated, this is a relatively underdeveloped area of study. Drawing inspiration from White's (1967) thesis regarding the ongoing influence of religious ideology and tradition upon environmentalism, this study will attempt to develop on these initial ideas with a particular emphasis on climate change and the specific characteristics of this issue. There are many elements specific to climate change that may hold distinctive conceptual characteristics for individuals beyond the broader category of environmental issues, and as such major religions' relationship with climate change risk perception likely has some unique characteristics alongside this. Climate change's position as a uniquely global risk, holding consequences for the whole planet, alongside the existential threats to habitats, wildlife, and people in particular geographical regions in the longer-term, make it a unique phenomenon for an analysis of religion. The various perspectives regarding humanity's place in nature, our relationship with God(s)/ the divine, our capacity to influence nature and the extent of divine providence are examples of the ideological perspectives that could be pertinent in shaping climate perceptions across the world.

The goal of this theory is to develop a typology of religion that can be generalised across different religions. The expectation is not to produce a perfectly accurate picture of all religions' relationship with climate change risk perception, but to rigorously test the validity of the typology and make corrections as is necessary according to evidence developed through analysis. The diversity amongst religious individuals and communities across regions and within countries makes any attempt to generalise difficult, with little evidence of "straightforward causal relationships" between the factors discussed and climate change attitudes (Curry, 2008; Eckberg & Blocker, 1996). Furthermore, the methodology of this research simply does not allow for in-depth analysis of the intricacies within specific denominations in particular countries. For example, survey data doesn't differentiate between individual adherence to the various aspects of Buddhism explored below. Therefore, while the shortcomings of such an approach are recognised, there is clear utility in providing this framework to continually test empirically and adjust according to future empirical evidence.

Through this theoretical approach an understanding of the dynamics of the relationship between religions and climate change risk perception is developed. In many ways, this should be viewed as an early contribution towards an understanding of religion and climate change risk perception from a global perspective. Curry (2008) notes the necessity for additional typologies, in particular religious environmental typologies, which enable the analysis of unique perspectives provided by religion(s). Ibid's framework relates specifically to Christianity and includes many elements considered in this research, including eschatology, integration, and responsibility. Each of these are relevant to this typology and will be referenced where they become relevant. Ives et al. (2024) note "the importance of incorporating multiple values of nature to achieve more just and sustainable conservation outcomes" yet emphasise the conceptual and practical difficulty in being inclusive these worldviews, which people may view as fundamental. This theory is by no means a comprehensive exposition of these complex perspectives but aims to offer a conceptual tool for the analysis of climate change in future research.

Firstly, aspects of religion that may be pertinent to climate change risk perception are explored. These include particular ideological and doctrinal elements that are present amongst religions

to varying degrees, such as anthropocentrism, biocentrism and eschatological perspectives. Similar elements have been explored from a psychological framework by Preston and Baimel (2021), and these will be cited where relevant. Once again, this is undertaken with recognition that individual perspectives needn't map on directly to the specific doctrinal elements of the religion they claim membership of (Eckberg & Blocker, 1996). Following this, a focus on sociological questions, including to what extent contemporary manifestations of religion can be considered compatible or amenable to science, levels of religious attendance, levels of religious fundamentalism and contemporary attitudes of religious authorities towards climate change. Country-specific factors include majority religion, religious freedom, levels of fundamentalism, and whether the country has a state religion, and how these factors may interact with factors such as country wealth.

The typology is to be comprised of religions that are present within countries according to the expected relationship that each holds with climate change risk perception. Some religions and denominations have been excluded due to the available empirical evidence, the scope of the upcoming analyses, and the availability of data, discussed in the upcoming methodology section. Therefore, this typology covers 6 major religions, with space for multiple denominations within religions where appropriate. This allows for the coverage of most of the individual religious affiliations which feature in the analysis chapters and span multiple countries.

2.3.2 Climate change risk perception

Climate change risk perception is a multifaceted concept, as explored in the literature review. Elements of both van der Linden's (2017) and Farrokhi et al.'s (2020) analyses of climate change risk perception were cited in the literature review chapter, and specific elements of their understandings will be outlined here in so far as they are relevant to the typology being developed here. Both authors pay particular attention to the psychological determinants of climate change risk perception, which are relevant to understanding the dynamics underlying its relationship with religion. There is also space for the development of sociological understandings of religiosity, which remain underexplored and are likely not fully captured by these psychological accounts.

Farrokhi et al. (2020) explicitly note cultural and religious aspects relevant to climate change risk perception, stemming from the specific value orientation present in different societies and communities, the potential differences between dominant and subculture and traditional belief-based views regarding crises. Van der Linden (2017) noted that the influence of religion "appears limited", arguing this is due to the fact that socio-demographic effects tend to be less influential or mediated by cognitive, affective, social and cultural influences. As such, direct effects are usually weak (ibid). While this is likely still the case, a deeper understanding of the impact of religion, particularly the understudied non-Christian world (ibid), is nonetheless valuable. Furthermore, exploration of country level differences according to various elements of religiosity remains underexplored in the context of climate change risk perception.

2.3.3 Relationship with nature

A conceptualisation pertinent to the analysis of different religions is the degree to which each religion views humanity as central to life on earth. This is here conceptualised as a spectrum ranging from biocentrism to anthropocentrism. Critiques of the predominant usage of anthropocentrism as a negatively loaded term highlight the "highly ambiguous [and] 'slippery'" nature of the term and its often-implicit use in arguments linking it to environmental crises (Droz, 2022). Therefore, it is important to provide working definitions of both anthropocentrism and biocentrism, as well as explicitly linking these concepts to climate change, specifically risk perception for the purposes of this research. Further, this theoretical framework acknowledges that anthropocentrism is not inherently associated with negative conceptions of the environment or low climate change risk perception, and this will be explored later in this section.

Anthropocentrism is conceptualised here as a hierarchical perspective that places humans as primary agents of moral concern atop this hierarchy. It is also generally a dualist perspective that makes clear distinction between humans and nature. As will be shown, degrees of anthropocentrism can vary significantly and therefore should not be seen as a static label. Nonetheless it generally points towards a human-oriented approach that prioritises related issues over those of the natural world and other animals. For example, while religious concepts of stewardship and dominionism differ substantially, both place humanity as a primary moral

agent, with a strong dualism between humans and nature/animals. As such, both are relatively anthropocentric when considered amongst other religious beliefs.

Biocentrism is placed upon the other end of the spectrum. Biocentrism generally emphasises a non-hierarchical, or at the least less strictly hierarchical, perspective on the value of various species of life and this can also encapsulate a macro-perspective relating to the care for the planet and/or 'mother nature'. It can also be non-dualist, with an understanding that humans are as much part of the natural world as any other being and its relationship should be managed as such. Biocentric perspectives also vary substantially, with degrees to which life is viewed as sacrosanct as well as hierarchies placing some beings over others in terms of expected consideration. Attfield (2013) highlights that elements of biocentrism are observable in many world religions including Buddhism and Hinduism, as well as monotheistic religions such as Christianity, Judaism and Islam. As such, Attfield describes such a stance as a genus of worldviews rather than a worldview in itself. Interpretations of Buddhism and Taoism[10] appear both highly biocentric and/or diametrically opposed to anthropocentrism. These include perspectives on renunciation of the craving of both sense pleasure and existence itself (Bhikkhu, 1993) as well as the most radical anti-anthropocentrism such as revulsion for the world and anti-natalism, particularly in some interpretations of Buddhism (Zanderbergen, 2022).

On the other hand, White (1967) argued that Christianity, particularly in the west, "is the most anthropocentric religion the world has seen", with dominion theology being characteristics of this highly anthropocentric view. However, varying degrees of anthropocentricism are present in elements of religious practice within Christian denominations and western countries too, with the concept of stewardship being prominent within certain Christian teachings. Stewardship pertains to human's responsibility over the environment, "to take care and protect (but not rule)" God's creation (Shin & Preston, 2021). Ibid contrast this with dominion beliefs, defined as "a mastery perspective on nature" wherein the use of animals, plants, and resources

[10] Daoism is another name for Taoism, with the distinction only existing due to translation. As such references referring to Daoism will be considered in discussions regarding Taoism.

of earth for human benefit is explicitly God's will. These views certainly contrast in quite fundamental ways, with the latter being broadly more anthropocentric in its outlook.

Other Abrahamic religions also take explicit stances on stewardship in particular. Islam places emphasis on human stewardship (Khālifah) and responsibility to God (Ecklund & Scheitle, 2017), appearing to disregard notions of dominion in a stronger sense than Christianity (Hancock, 2019). The Qur'an (Surah Yunus, 10:14) states "Now We have appointed you as their successors in the earth to see how you act", which many Islamic scholars have taken to be an example of the responsibility of Muslims to act as stewards. The verse also provides evidence relating to the dichotomy of free will and determinism which will be discussed in the following section. There are clearer examples relating to the environment elsewhere in the Qur'an. Several chapters emphasise Allah's dislike of corrupters [of the land], those who waste food and drink and live in extravagance (Bsoul et al. 2022).

Judaism may be closer to Christianity due to their in-part shared scripture, with the statements in the Torah (Old Testament) contributing to the justification of both stewardship and dominionism. Tikkun olam, which broadly refers to the Jewish principle of 'repair the world', places responsibility on Jews to engage in actions considered healing, which in the contemporary world includes issues of social justice and the environment (Ecklund & Scheitle, 2017). On the other hand, there is little research referring to Jewish dominionism, and explicit manifestations of dominionism in the contemporary world does appear to be a phenomenon generally associated with Christianity, perhaps most prevalent within the US where it emerged (Gerrard, 2020; Ladner, 2022) though increasingly in other countries with Pentecostalism in Latin America (Gerrard, 2020), Australia (Pepper & Leonard, 2016) and Africa all having links to dominion theology. Therefore, the shared scripture is not expected to influence similar levels of dominion theology amongst Jews as with Christians.

The doctrines of stewardship and dominion have been shown to incur disparate outcomes regarding environmental and climate attitudes. Shin and Preston (2021) show that in the US pro-environmental measures, including belief in anthropogenic climate change, are positively associated with stewardship and negatively associated with dominion. Pepper and Leonard

(2016) indicate this may be the case in Australia too, with evangelical and Pentecostal churchgoers showing lower climate change concern than both other denominations and the general population. As such Christianity may be uniquely orientated towards anti-environmentalism in various countries, depending upon the prevalence of Pentecostalism, evangelicalism, and independent Protestant churches. This may vary depending upon other factors, however. Research indicates that African Pentecostal Churches in South Africa are engaged in environmental care and education amongst populations most at risk of the effects of climate change, with less than 30% climate literacy in South Africa (Kabongo & Stork, 2022). A majority of respondents from interviews indicated that they observe the effects of climate change around them, while it is unclear whether the churches are aligned with dominion theology. This shows that generalisations of religious denominations, particularly wherein other factors including physical vulnerability to climate change are prevalent, must consider national variations.

This axis can be directly linked to conceptualisations of climate change concern directly, such as Stern et al. (1993) and Stern (2000), who noted egoistic, socio-altruistic and biospheric value orientations. Van der linden (2017) notes their utility due to the capacity for standardisation across different countries and validity cross-culturally. Furthermore, the biospheric value orientations, while explicitly forwarded within a triad of concern, are also shown to reliably predict climate change risk perception (ibid), though this may vary by country (Martin, 2023). As such, in-depth understanding of the contribution of various religions to said value orientations, and vice versa, could prove very valuable with regards to understanding the relationship between religion and climate change risk perception.

Anthropocentrism is generally expected to lead to lower levels of climate change risk perception. Climate change risk can be, and often is, conceptualised as an issue that will impact humanity in myriad ways and thus risk perception can be heightened due to anthropocentric considerations. As Stern et al.'s value orientations show, climate change can be viewed as an existential threat purely from an anthropocentric perspective, with the majority of one's concern being forwarded to vulnerable communities most at risk to the effects of climate change. Stern et al.'s (1995) empirical analysis of the value orientations show that while egoistic

values are negatively associated with environmental concern and biospheric and altruistic were positively associated, the differences between biospheric and altruistic perspectives could not be established. This is furthered by Kortenkamp and Moore (2001) who explicitly link biospheric values to ecocentric perspectives and altruistic and egoistic values to anthropocentrism. This emphasises that degrees of anthropocentrism associated with these orientations can impact environmental concern significantly, and this may extend to climate change risk perception.

Further, extreme biocentric points of view could utterly disregard the importance of human life, and while it would be unlikely that they could view climate change as low risk to the biosphere itself, a deeply biocentric perspective could view climate change as a consequence of the planet 'adjusting' itself to human excesses, and therefore take a more neutral response to the threats posed by climate change to humans. This latter perspective is unlikely to be particularly prevalent due to its extremity, with so-called 'dark green' or 'deep' biocentrism still tending towards highlighting the 'interests' of nature over purely human ones (Curry, 2011). Nonetheless, anthropocentric concern for climate change is an established understanding, and therefore it is important to state clearly that the spectrum is not expected to correlate directly with climate change risk perception in either direction i.e. more anthropocentrism does not necessarily equal lower risk perception.

The degrees to which religions vary in their perspectives regarding humanity's relationship with nature is expected to be integral to the influence of religion on individuals' climate change risk perception. The evidence observed supports the perspective that highly anthropocentric perspectives tend to lead to lower climate change risk perception, both amongst religious beliefs as well as political ideologies. With the majority of scholarship focusing on Christianity, engagement with foundational perspectives of other religions were explored, with evidence of a divide between Abrahamic or Western religions and so-called Eastern religions, which emerged and remain prevalent in Asia. While White's (1967) statement that Christianity is the most anthropocentric religion is considered accurate due to the empirical evidence considered, the variation with Judaism and Islam is expected to be rather slight, in consideration of shared scripture, with Judaism in particular, and shared values across the three. Eastern religions appear considerably less anthropocentric, though where they place on the axis is quite difficult

to determine, especially considering the lack of empirical studies inquiring into individual perceptions on the topic. Further, while more biocentric perspectives are expected to lead to high climate change risk perception, this must be established with further research.

2.3.4 Determinism and human agency

The degree to which a religion prescribes agency and/or places responsibility (Curry, 2008) upon humanity to influence the ongoing environmental crises may contribute to varying effects from religion on risk perception. Determinism is a nexus of perspectives that vary substantially, with the commonality that human thought and action are not under the total control of the subject, with hard determinist perspectives arguing that humans have no agency over their behaviour whatsoever. The influence can be internal, through unconscious processes of the brain or soul, and/or external, guided by some divine entity or phenomena. On the other hand, free will indicates that human agency exists and manifests through the subject themselves. This may be subject to limitations; however, it can generally be considered as antithetical to determinism. Contemporary debates have engaged with compatibilism and the dialectic of selfhood (Pereboom, 2014), however, individual perspectives on the matter rarely engage with the intricacies of these philosophies and tend towards one side of the spectrum (Wisniewski et al. 2022).

Qualitative research pertaining to the relationship between religion and climate change risk perception often report deterministic perspectives relating to climate change being God's plan. Farrokhi et al. (2020) quote an Iranian participant, though don't disclose the participants religious affiliation, who reports low "worry" due to their perspective that "all these happenings are usual and natural and what God wants." This indicates that a deterministic perspective can contribute to lower risk perception, wherein climate change is viewed as a divine prescription. This needn't necessarily be the case, however. It is conceivable that an individual could hold the same view, yet from the perspective of the aforementioned value orientations as well as cognitive and emotional factors, experience higher levels of concern and risk perception regarding climate change.

Further evidence provided by Swim et al (2010) emphasises the potential for said beliefs to lead to substantial behavioural differences. A segment of pacific Islanders living on low-lying atolls at high risk from climate change related sea level rises have begun purchasing less vulnerable land in Australia. However, another group in the same population professed belief that God would not put them at risk, explicitly referencing biblical scripture wherein it is promised that the earth will never experience a great flood akin to that in the story of Noah (Mortreux & Barnett, 2009). Kane & Perry (2024) found a similar effect in this US, where believe in an interventionist benevolent God was associated with lower climate change concern. Ibid emphasised the importance of belief in God's determination of earthly phenomena in shaping the "perceived severity of climate change and need for policy intervention". This is a clear example of how religion can directly influence reasoning regarding both climate change risk perception and action even in regions where the effects of climate change are already impacting everyday life.

Yilmaz et al. (2018) indicate that in the contemporary Muslim world, belief in fate and predestination are "more commonly embraced than in the Western world", and this is supported by World Values Survey data too though this varies greatly within Christianity too (Pipes, 2015). Yizmaz et al.'s (2018) research in Turkey indicates that degrees of fatalistic determinism (belief that the future has already been determined) are highest amongst religious Muslims, in particular Sunni Muslims. Scripturally, there is some justification for this, with may Quranic verses indicating that human will is always subject to the will of Allah. However, there are several verses that emphasise free will and accountability to Allah. Meanwhile Christian and Jewish denominations also vary, with similarly mixed scriptural perspectives. Pipes highlights the higher levels of fatalism amongst Orthodox Christians in comparison to protestants, who have the lowest levels amongst Christians, likely due to the latter's emphasis on earthly responsibility (Weber, 1992).

The concept of free will is prevalent in all Abrahamic religions, meaning that perspectives on the degrees to which humans have control over worldly matters varies significantly both across and within religions. Religiosity in the UK for example indicates that religious people are most likely to be fatalist (compared to non-practicing religious and non-religious), though the largest proportion of religious individuals believe the perspective that while the course of life is

predetermined, we have the power to change it (Dinic, 2021). This implies that should these perspectives influence climate change risk perception, somewhat similarly to the measures such as personal and collective efficacy, then they will vary quite significantly within the Abrahamic religions. When compared to non-religious individuals, Christianity, Islam, and Judaism are expected to have higher degrees of fatalism and that higher degrees of fatalism will result in lower climate change risk perception, though this effect is expected to be quite marginal.

Evidence regarding ideological contributors to personal efficacy indicates that religion is an important factor contributing to beliefs of personal efficacy regarding climate change, even controlling for socioeconomic variables (Morrison et al. 2015). Christian literalists high belief in human ingenuity to tackle environmental problems as well as dominionism, which ibid argue to be consistent with weak belief in climate change. Further, Nie (2019) provides evidence that different Christian denominations can influence substantially different levels of perceived self-efficacy across both adherents as well as entire populations. As noted in the literature review, higher levels of Conservative Protestantism indicates lower perceived self-efficacy across the entire population, while Catholicism indicates higher self-efficacy. This emphasises that religion can influence perceptions of individuals' and populations' perceived capacity to act with relation to climate change. This relationship will be developed further when discussing the typology.

There are several diverging perspectives on determinism in Buddhism. While it seems clear that the perspective does not engage with the notion of free will in the libertarian sense of fully autonomous individuals free to act as they themselves desire, whether Buddhist ideology prescribes a 'middle way' between determinism and free will or hard determinism is contested[11] (Repetti, 2014). Gier and Kjellberg (2004) argue that while the Buddha rejected "the existence of any self-causing agents" he did nonetheless "affirm that all events have a

[11] Hard Determinism is the perspective that actions are causally determined by natural conditions/laws, generally incompatible with the notion of free will as the will (thoughts, feelings, etc.) is merely the effect of prior causes outside the control of the agent e.g. electrochemical processes in the brain. For an expensive exploration of a determinist perspective see: Sapolsky, 2023.

multiplicity of conditions." This therefore represents a form of 'soft' determinism. There is little research on contemporary Buddhists perspectives on free will and determinism and as such it is difficult to establish whether either of these perspectives is predominant in any community.

Taoism appears to take a similar position to Buddhism, with the abandonment of 'the self' being emphasised perhaps more forcefully (Ni, 1993). In this sense, Taoism is antithetical to the notion of free will in the western or libertarian sense. However, a deterministic perspective needn't signal either low or high-risk perception, as the accompanying ideological aspects of the specific religion can alter the quality of the relationship between determinism and climate change risk perception. In the case of Taoism, it is fundamental that humanity does not go against the flow of nature (Xia & Schönfeld, 2011). Therefore, some contemporary Daoist perspectives view anthropogenic climate change as a disruption of this natural flow of events, and while the principle of 'non-action' could imply simply letting nature take its course, the very existence of anthropogenic climate change is a bastardisation of this principle and thus places responsibility on humanity to correct the flow that it has disrupted (ibid).

Hinduism is quite difficult to place due to its concept of Karma. While karma is supposed to function as a "moral retributive law" relating to man's actions, and thus implies a level of free will, many scholars in fact emphasise that as Karma implies that we are bound to the actions of taken in the past, taken outside of 'our control', the theory is in fact a deterministic causal dogma (Silvestre, 2017). Functionally, however, Hindus may not view their everyday actions this way. In this sense, as with every other religion, belief in free will is perhaps more integral to the understanding of individuals than the objective question of do humans possess it or whether it is an illusion. Nonetheless, the overall ideological perspective of each religion should be considered as it may guide individuals of different faiths to comparatively varied conclusions.

The 'third way' within this question is often labelled as compatibilism, which attempts to make free will compatible with determinism. In practice, all religions engage with some form of compatibilism, and as such no religion would be placed on the extreme ends upon a spectrum of determinism and free will. Nonetheless perspectives on free will and determinism are crucial elements distinguishing religions. It is important to emphasise that its contribution to climate

change risk perception is fundamentally tied to individual subjectivity. As noted above, a free will may or may not have standing in objective reality, however, the belief in it may be more important when analysing individual climate attitudes. Furthermore, even amongst hard determinists or fatalists, the perceived lack of control amongst said individuals does not necessitate a particular disposition to either high or low risk perception; many perspectives could be reasoned from this position. However, speaking purely in terms of the function of religion, this dichotomy is useful for identifying the differences between world religions in terms of beliefs regarding the level of human agency ascribed, and may provide some insight into varying subjectivities, though this requires more research especially relating to non-Abrahamic religions where neither quantitative nor qualitative perspectives are numerous.

2.3.5 Eschatology

Another element that could be vital in understanding the influence of religious ideology on climate change risk perception relates directly to conceptions of eschatology. Eschatology is the study of "the final end of things, the ultimate resolution" of creation or existence (Walls, 2009). It should be noted that the term eschatology originates from and refers to the Abrahamic religions, however, will be used as an overall term for perspectives on the end of humanity and the world in religious thought. Scholars have noted that climate change could be representative as a secular or green eschatology (Kuehn, 2019; Northcote, 2015; Cochet, 2015). With climate change's position in the public consciousness as a potentially existential question for humanity, it may hold relevance within various religions' eschatological expectations. This is distinct from the axis of anthropocentrism and biocentrism as a perspective that views climate change as an eschatologically important phenomenon could be concerned with the existential threat placed upon humanity and/or the natural world as it pertains to planet earth. Therefore, this provides a separate consideration wherein various religions may have disparate perspectives on climate change risk as a result of eschatological considerations.

Curry (2008) emphasises eschatology as one of the strongest factors that affect attitudes towards the environment in the case of Christians (Guth et al. 1995). Christianity has explicit passages which refer to the apocalypse including Isaiah 13(9-11), which Izidor and Igwe (2022) cite alongside passages including explicit environmental destruction such as the great flood and

the burning of Sodom and Gomorrah as evidence that devastating biblical events are often ecological and climactic in nature. Barker and Bearce (2012) indicate that support for government action on climate change in the US is negatively associated with the extent of end-times theology, however, don't test whether such beliefs indicate higher risk perception. Drawing from other studies though, Christianity tends to predict lower risk perception in the US, indicating that eschatological perspectives are not linked to climate change in general. The apocalypse expected by end-times theology adherents needn't be climate change as it could take a multitude of different forms. However, this interpretation cannot be disregarded from a possible explanation of religion's influence across the sample of 28 countries.

Empirical evidence relating to eschatology and climate change attitudes provides mixed results. Lowe et al.'s (2023) analysis of a sample of Christian undergraduates in the US highlights some interesting factors. These young individuals, heavily sampled from evangelicals, did not hold apocalyptic views in the traditional sense, with the belief that the earth will be renewed being more prevalent than a belief that it will be destroyed. Ibid also shows that these students are more likely to hold pro-environmental and pro-climate attitudes. This is interesting as it indicates a divergence amongst young evangelicals and their older counterparts. Ibid show evidence of eschatology influencing a small number of individuals' climate change attitudes. Those who hold strong views about the fate of the earth, particularly more apocalyptic perspectives, are significantly less likely to view climate change as a priority for either Christians or the government. This diversity of thought is evidenced amongst US evangelical protestants once again highlights the challenges associated with generalisation, while also providing some support for the importance of eschatology amongst adherents.

Buddhist eschatological perspectives vary significantly, with Nattier (2009) describing the concept as a "misnomer" due to the Buddhist perspective on beginningless samsara – the cycle of birth and death of the universe, for which there is no beginning nor end. However, on the level of the end of individual human being and the earth, Buddhism does provide perspectives that vary greatly depending on cultural contexts. Perhaps more so than Christianity, which despite varying in interpretation does have a single text to which most adherents refer,

Buddhism cannot be said to have an eschatology, due to the vast array of texts and perspectives developed over thousands of years (ibid).

The seven suns discourse in the Aṅguttara-Nikāya (SuttaCentral, 2018) may provide some context for a Buddhist perspective on the matter of eschatology. The passage references the buddha's perspective on the impermanent, unstable, and unreliable conditions of the world with the appearance of seven suns, all of which incur different destructive ecological phenomena from the drying up of the great rivers and lakes, volcanic eruptions and "flames swept by the wind as far as the Brahma realm" (ibid). Whether these teachings are taken literally or as a representation of the core message that "conditions are impermanent" by Buddhists in various social contexts is particularly difficult to judge. As indicated, Buddhism differs significantly from Abrahamic religions due to the number of sources relevant within the religion.

2.3.6 Attendance of religious services

Attendance of religious services is another factor that will be considered. The expectation here is that the more one attends their place of worship, the more likely they are to adopt the message particular to their religious denomination. As such, higher attendance is expected to act as a catalyst towards more attitudinal alignment with their religious doctrine. Further, the overall level of attendance likely signals the extent to which a particular religious community holds homogeneous beliefs. High attendance is expected to indicate that more individuals affiliated will hold similar views on issues, including climate change risk perception. On the other hand, lower attendance will likely indicate more heterogeneity in beliefs amongst affiliated individuals. High attendance is also expected to increase the likelihood of fundamentalism, which as shown below likely impacts climate change risk perception. This won't be included in the typology itself, as attendance is considered a secondary metric through which the effects of religion (within the typology) may be increased or decreased; the typology is purposed as a tool for comparison between religions.

2.3.7 Fundamentalism and literalism

Studies analysing the impact of religious fundamentalism are generally in agreement that fundamentalism negatively predicts pro-environmental attitudes and risk perception (Preston & Shin, 2022). Ibid argue that fundamentalism (alongside spirituality) is considerably better for predicting environmentalism that general religiosity. Therefore, fundamentalism from an international perspective may be a useful lens through which to analyse risk perception in the 28-country analysis, with overall levels of fundamentalism potentially predicting risk perception. Further, the question of whether fundamentalism in different religions exerts similar impacts to Christianity will be useful for gaining an understanding of the influence of specific scripture.

The effect of fundamentalism could theoretically vary depending upon the specific religious scripture, with the belief that specific doctrines are inerrant and divinely inspired being potentially impacted by the quality of the scripture itself. For example, more explicitly biospheric religions could lead to a strongly pro-environmental form of fundamentalist religiosity. However, religious fundamentalism often manifests or helps produce authoritarian power structures, producing restrictive social orders while targeting other religious and ethnic groups. Therefore, even religious scripture that may be explicitly purposed as metaphorical or as a spiritual guide may not have the influence on manifestations of fundamentalism in this strictly literalist sense. This implies that the perception that specific scripture leads to specific social action based specifically on that scripture may be too simplistic from sociological and psychological perspective. The contribution of other factors such as politics, culture, and social norms as well as cognitive processes and biases cannot be discounted.

For example, links between religious fundamentalism and authoritarianism (particularly social conservativism) are well established (Hunsberger, 1995), with both tending towards rigid belief systems (Preston & Shin). This link has been shown through mediation analysis to have impacts on environmentalism and climate change concern too, with part of the effect of fundamentalism being mediated by right-wing authoritarian ideology (Skalski et al. 2022). Manifestations of religious fundamentalism in authoritarian states include Christianity, Islam, Hinduism, Buddhism and Judaism implying that no religion regardless of scripture is immune

from this phenomenon. Therefore, while fundamentalism may incur varying degrees of environmentalism depending upon the specific teachings of the religion, there does appear to be a consistent logic between religions in terms of how they relate to dominant political power structures. However, these fundamentalisms are rarely used outside of the context of "religio-ethnic violence" and when describing what is essentially religious nationalism is different parts of the world (Haynes, 2019). Whether this persists or influences individual's religious attitudes on various subjects is less clear, with little research on the subject of non-Abrahamic religious fundamentalisms (Skalski et al. 2022).

As such, while the quality of fundamentalism may change according to each religious dogma, it may also be the case that generally the impact of fundamentalism will generally lead to negative attitudes towards environmentalism and climate change when compared to more secular and liberal forms of the same religions. Therefore, the overall level of religious fundamentalism in each country analysed is expected to be a significant contributor to religion's overall effect on climate change risk perception, though the degree to which fundamentalism impacts climate change attitudes may vary across religions. For example, Christian fundamentalists belief regarding climate change may vary more significantly compared to a general population than say Jewish fundamentalists. Furthermore, this effect could be positive, negative or indeed inconsequential, depending upon the religion, with the potential for Buddhist fundamentalists to have higher risk perception than the general population, while Christian fundamentalists will likely have lower risk perception. In the case of the former, this is speculative as research on Buddhist fundamentalist climate change perceptions is particularly lacking. Further research into manifestations of fundamentalist religiosity in non-Abrahamic religions is necessary to grasp its impact.

Meanwhile, fundamentalism itself is conceptualised as a secondary effect to those included in the 2-dimensional typology, akin to attendance. For example, Christianity is expected to be the most anthropocentric religion. Therefore, fundamentalists are likely to align with this element of the religion to a greater degree than less fundamentalist adherents. However, it is also possible that the effect of fundamentalism is negligible. This is possible if the characteristics of the religion are not particularly geared towards a strong perspective on the environment and

climate change. This could lead to fundamentalist adherents not taking particularly strong ideological positions on issues such as climate change. As such, the question as to the effect of fundamentalism remains relatively open for analysis.

2.3.8 Positions of Religious Institutions and Figures

Official attitudes of the religion's contemporary institutions and communities on climate change may be important for understanding the relationship between religion and climate change at the individual level. Grim (2019) helpfully compiled statements from many official religious organisations, explored below. Mapping these onto the majority religion for each country analysed may be helpful. The statements from leaders of major world religions are all relatively strong in their consensus regarding contemporary climate change, including its anthropogenic origins and the requirement to decarbonise energy systems. Many make explicit critiques of contemporary human society including references to greed, profit, consumption and growth.

Altogether, there is a similarity between religious institutions in terms of the overall focus within the statements explored. This indicates that the official positions of religious institutions and leaders are unlikely to be particularly important for identifying the differences in risk perception of individual adherents. It may be more useful for an analysis of specific attitudes, which may be emphasised too varying degrees by different institutions. The statement on Buddhism and Hinduism did diverge slightly from the Abrahamic religions, with a more explicitly biocentric understanding; the stronger critique of global economic systems and the emphasis on the reliance of humanity upon mother earth was particularly prevalent here. Meanwhile Christianity and Islam focused more upon the humanitarian consequences of climate change i.e. impact on women and the poor.

Anglican

Anglican Bishops from 6 continents issued a joint statement indicating acceptance of the scientific evidence of human induced climate change (Makgoba et al. 2015). The statement emphasises the uneven impact of climate change on indigenous communities due to exposure to the effects and women because they make up a majority of the world's poor (ibid). They

make calls for specific action on both individual, national and international levels. They reference “the covetous desires of individuals and nations to possess what they do not own" and “the greed which exploits the work of human hands and lays waste to the earth” (ibid). Further, they ask God to “grant the courage to recognize humanity’s failure to maintain [His] creation” (ibid).

Buddhism

Buddhist leaders and academics issued a strong statement regarding climate change, referencing IPCC and UN reports as evidence of the pressing issue of combatting anthropogenic climate change and emphasising the need for individual, collective and systemic change (Aiken et al. 2015). The statement offers a critique of the contemporary economic paradigm regarding growth and profit, and overall is a particularly strong call for action at all levels of society (ibid). Specific elements of Buddhism referenced include collective karma for human action as well as the utility of the four noble truths and recognition of the “three poisons of greed, ill will, and delusion” to face up to the human induced problem. The statement also emphasises the importance of viewing Earth as our mother and in this case “the umbilical binding us to her cannot be severed” (ibid).

Catholicism and Orthodox

Pope Francis and Ecumenical Patriarch Bartholomew issued a joint statement regarding climate change. The statement implicitly recognises the evidence of anthropogenic climate change citing “our propensity to interrupt the world’s ecosystems… insatiable desire to manipulate the planet’s limited resources, and our greed for limitless profit in markets” (Bergoglio, J. M. & Arhondonis, 2017). They claim human moral decay “obscures our calling as God’s co-operators” (ibid). They place particular emphasis on the impact on the world’s poor and the respect for all humans and living creatures. They emphasise the importance of prayer as no solution will be reached if God “is not by our side”. They call for greater simplicity and solidarity in our lives and those with social, economic, political, and cultural responsibility to hear the cry of the earth and attend to the needs of the marginalised.

Hinduism

Hindu spiritual leaders made a statement in 2015 regarding climate change. They emphasised the principle of dharma, through which the consequences of our actions should take into consideration not just human beings but all beings (HCD, 2015). They note that earth itself is a "being of full of divinity" to which we need to become servants. They highlight specific principles of "kutumbakam (the family of Mother Earth), sarva bhuta hita (the welfare of all beings) and karma. Specific solutions are forwarded including changing energy, land and agricultural practices as well as use of natural resources. On the individual level they state that the adoption of a plant-based diet "is one of the single most powerful acts" that a person can undertake.

Islam

Islamic leaders from several countries made a statement regarding climate change which indicates acceptance of the scientific evidence of anthropogenic climate change (Khalid et al. 2015). They emphasise the dire and uneven consequences to the planet should clear targets and monitoring systems not be adopted and call for zero emissions as soon as possible (Ibid). Ibid state that "our species, though selected to be a caretaker or steward (khalīfah) on the earth, has been the cause of such corruption and devastation on it that we are in danger ending life as we know it on our planet (Ibid). Ibid point toward the Prophet Muhammad's lifestyle including frugality and sustainability.

Judaism

The most recent statement made by Jewish leaders on ecology, which has a focus on climate change, accepts the scientific evidence of anthropogenic climate change, referring to Ecclesiastes 7:13 wherein God orders humanity not to "spoil and destroy [His] world" as after humanity, there will be no one to repair it (COEJL, 2018). They cite the pressing need to transform the global energy economy and address global climate change. They argue "enlightened stewardship is not only a religious and moral imperative; it is a strategy for security and survival" placing stewardship as a necessity and climate change as an existential threat (ibid). They call for "aggressive measures" directed at the fuel economy that must be

implemented “even at the expense of limited and reasonable increases in short-term cost of living and personal comfort” (ibid).

2.3.9 Majority Religion

This factor is relevant to the study of cross-national analysis. Evidence indicates that at the country level, “historical manifestations of religious nationalism and a close and supportive relation between state and dominant church increase the salience of religious boundaries” in a country, “even when controlling for different levels of secularization [sic]” (Trittler, 2016). Therefore, from a qualitative perspective the historically dominant religion can be considered important to the institutional makeup of the country, even with extensive secularisation in many countries across the world. This has been explored extensively in sociological thought, with Weber’s *Protestant ethic and the spirit of capitalism* being an early example of note. Interpretations of climate change and the environment are likely influenced by the wide range of social institutions pertinent in a given country, many of which will have been shaped in part by historical, and perhaps ongoing, religious input (Desbordes & Munier, 2021). This historical influence will be captured by the majority religion of the country to some degree, and as such is an appropriate consideration for the analysis of religion on the country-level.

2.3.10 State Religion

There is evidence of religion’s effect on religious individuals relative to non-religious individuals in their own countries, with little analysis of country-level variables. Whether a country has a state religion or not, and which religion is established in each country, may hold some relevance for magnifying the effect of religion. This could theoretically lead to varying influence of religion from a range of institutional factors. This can be considered an aggregate level factor as the experience of individuals living in countries with state religions may influence areas of life regardless of personal religious affiliation. For example, religion may have more influence within education systems in countries with state religions, meaning the quality of the education, whether for religious individuals or non-religious individuals, may be different than countries without a state religion. Further, North and Gwin (2004) showed that amongst 59 countries, state religions led to lower attendance.

2.3.11 Religiosity and Wealth

It is expected that the effect of religiosity may vary across countries, and one mechanism through which this may occur is across countries of varying levels of wealth. Evidence from the literature indicates that the proportion of religious individuals in countries is negatively correlated with GDP per capita, emissions and energy use as noted in the literature review (Skirbekk et al. (2020a). Ibid indicate that this may lead to countries with more religious populations behaving substantively differently in areas related to climate change, compared to those with less religious populations. While evidence shows economic development, social stability, and prosperity are associated with less religiosity (Baar, 2021; Storm, 2017; Barro & McCleary, 2003), this trend may not persist across all countries and may depend upon the character of the dominant religion in the countries and other social factors. Nonetheless, from a contemporary perspective, where all countries are increasingly aware of climate change and too some degree expected to act on climate change, it remains to be explored how the effect of religion on climate change risk perception varies across countries of differing levels of wealth.

The evidence regarding the effect of individual religious affiliation across countries of differing levels of wealth is particularly under researched. As such, it is possible that the effect of religious affiliation may vary dependent upon the wealth of the country. The declining influence of religion, due in part to the aforementioned factors, may manifest in variation in the impact of religion. However, little is understood about the variation of the same religion across countries depending upon wealth. Secularisation thesis scholars often refer to the declining 'need' for religion in wealthier countries from a functionalist perspective (Zheng et al. 2020; Sachdeva, 2016). While this so-called declining need can be debated, it does point to the fact that material conditions and ideological manifestations are in many ways interdependent. It is reasonable therefore, to argue that climate change risk perception may vary depending upon both religion and wealth independently but may also have a dependent relationship with one another.

Religion holds functional value as a broad philosophical outlook and a mechanism of social cohesion, which may be particularly important in countries and communities wherein low levels of wealth have not enabled institutions to fulfill needs, i.e. the physiological and safety needs of

Maslow's hierarchy, and the perception of life as difficult and perhaps unjust may be more prevalent. It is through this difference that the importance of religion may vary across countries based on wealth, particularly for individuals where perceptions of injustice and fairness are likely to manifest. Furthermore, this also coincides with the function of religion as a mechanism for knowledge and lens through which to view the world. It is possible that religion in less wealthy countries may be a more fundamental epistemological tool, vital to developing conceptions of the environment and complex phenomena such as climate change. In this sense, religion would be more necessary in less wealthy countries due to the lack of opportunity and/or will to develop institutions based upon scientific rationalisation.

This emphasises the potential dual-edged effect of religion, as both a source of philosophical and epistemological conceptions, providing knowledge about the world in its complexity, while also providing a more flawed epistemological basis for understanding the material world than contemporary scientific methods. It is possible therefore that religion may play a greater role developing risk perception in less wealthy countries. Meanwhile, in wealthier countries, religion is expected to have a generally negative effect, with religious individuals expected to have lower risk perception relative to non-religious individuals, with some variation across different religions as outlined earlier in this section. There is limited literature exploring the potential effect of religion on economic growth, and therefore wealth (Wang, 2014; Ruck et al., 2018). Nonetheless, this research is particularly interested in the potential effect that wealth has on religious ideology, and how this potential relationship impacts climate change risk perception.

Figure 2.1 Typology of religion's expected influence on climate change risk perception

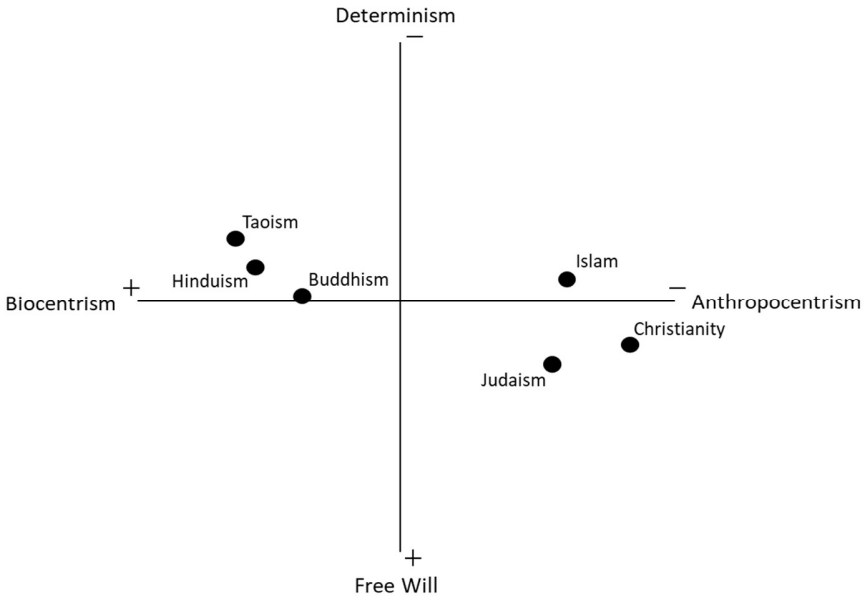


Figure 2.1 - 2-dimensional plot representing the typology of religion relating to its expected effect on climate change risk perception

Anthropocentrism and Biocentrism

The horizonal axis of the typology (Figure 2.1) of the influence of religion and climate change risk perception represents variation between religions regarding degrees of biocentrism and anthropocentrism. It should be noted that, each point represents a mean of the expected biocentrism/anthropocentrism for each religion, and this is especially important in this case as this research is inquiring into individual attitudes meaning the variation within religions is expected to be substantial. It should also be noted that this spectrum takes into consideration not just scripture but also expectations of the contemporary beliefs of adherents. This is why while the differences in scripture on anthropocentrism between Islam, Judaism and Christianity may not be hugely significant, the contemporary practice of these religions is expected to act as a significant differentiator between them.

The effect of anthropocentrism on climate change risk perception is not clearly understood. There is evidence that biospheric values and more biocentric perspectives are "especially important" as an indicator for higher risk perception, relative to other context variables i.e.

response-knowledge and descriptive social norms[12] (Van der Linden, 2014). There is some evidence that the altruistic and egoistic incur different effects from one another, with the former coinciding closely with biospheric values and the latter potentially indicating lower risk perception, though this is still not sufficiently established. This highlights a potential multi-dimensional effect of an anthropocentric worldview on climate change risk perception, and as such it is important to establish this clearly here, with each mechanism outlined here observable in figure 2.2 below. As stated, this research expects anthropocentrism to generally lead to lower climate change risk perception. One element of this does coincide closely with egoistic perspectives that do not factor either humanitarian or biospheric considerations into general attitudes. This is expected to contribute to substantially lower climate change risk perception.

Short-termism may also be a factor in anthropocentric worldviews that contribute to a lower climate change risk perception, and this could apply across egoistic and altruistic value orientations, although likely to differing degrees, meaning it should be included as another dimension of anthropocentrism. On the other hand, future orientation is linked to higher climate change concern (Zhu et al. 2020). Short-termism here would generally mean prioritising contemporary issues with shorter-term benefits to individuals or societies i.e. inflation and energy prices, which may or may not impact climate change in a negative way but likely signal lower risk perception[13]. This could be a result of several socio-psychological factors. For example, motivated reasoning may lead those concerned with contemporary social issues from partisan perspectives to compartmentalise the threat of climate change (Bayes & Druckman, 2021;). It is possible that religious ideology functions similarly to political partisanship here, with the roles of value affirmation and social consensus seeking influencing perspectives on climate change through motivated reasoning, due to these directional goals (ibid; Ezawa & Fagan, 2015).

[12] Perspectives on how important it is that others are taking action on a given issue.

[13] It is important to note that individuals who perceive climate changes as a temporally distant threat are not necessarily biased in favour of the short-term, as this could be a result of information-seeking factors instead, although there is likely some cross-over.

Another possible contributor could be the biases rewarded by religious beliefs, with evidence that Dutch Calvinists and atheists in the Netherlands indicate varying attentional processing styles, arguing that religious practice and exposure to "particular religious practices may lead… to a chronic bias towards particular attention control parameters" (Colzato et al. 2008). Ibid show following controls for race, culture, age, sex, IQ, and education (including that they had been educated in the Netherlands), religious individuals "attend to and process" global and local features of complex visual stimuli differently, with a tendency towards biasing local dimensions over global for the Calvinist individuals. This may go some way in explaining why religious and non-religious people often focus upon different issues in society, including climate change, and could contribute to short-termist perspectives too i.e. a bias towards localised issues may correlate with a bias towards the short-term.

It is difficult to extrapolate too much with regards to global religions from this, with ibid noting Calvinists are particularly private about their religious beliefs, which can't be extended to all sects of Christianity, let alone other religions. Nonetheless, it is possible that a focus on local as opposed to global issues could be a feature of certain religions, with the local community element being strengthened by attendance of religious services, which may also explain some of attendances effect on risk perception. There are no studies linking this to climate change directly and as stated a general direction of religion towards a bias from the local is difficult to establish, meaning this is speculation. Nonetheless, this is certainly an area for future analysis.

An important factor is denial or scepticism. This is a separate factor from short-termism as it can manifest regardless of views surrounding other social issues. Reasons for denial are numerous, but it makes sense to emphasise some that can be directly related to anthropocentrism. One potential contributor, which paradoxically minimises the capacity of humanity in a sense yet is nonetheless anthropocentric, relates to the perspective that humans are incapable of impacting macro-ecological systems such as the climate through their actions. This perspective may be particularly relevant for religious individuals and is commonly cited as a reason for not believing in anthropogenic climate change (Carr, 2010; Schuman et al. 2018), and tends towards climate skepticism and denial. Another is related to the motivated reasoning

mentioned above, specifically accuracy-motivated reasoning[14] (Bago et al. 2023), wherein the subjective importance of other social issues that may conflict with climate goals in some way may lead individuals to engage in a degree of scepticism or denial, perhaps to reduce cognitive dissonance.

Figure 2.2 The mechanisms for the effect of anthropocentricism on climate change risk perception

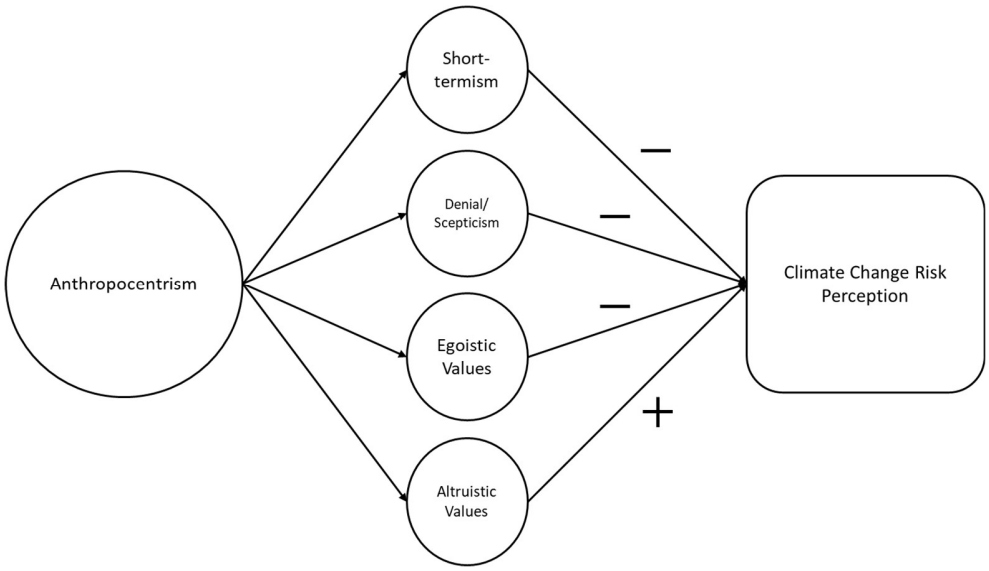


Figure 4.2 - Components of anthropocentrism expected to effect individual's climate change risk perception. Short-termism, Denial/Scepticism and Egoistic values indicate lower risk perception, while Altruistic values indicate higher risk perception.

The vertical axis represents variation between religions in terms of determinism and free will. The variation of beliefs within religions is expected to be wider here than the anthropocentrism/biocentrism axis. For example, many Christians may believe in total free will wherein their actions are unimpeded by the divine yet subject to judgement in the afterlife. Meanwhile, many believe that they are following God's plan and that their life is subject to intervention from the divine. However, each religion is likely to vary asymmetrically to the others too. There may be wider differences amongst Christians regarding the nature of human agency than amongst Taoists, for example. In order to gain a greater understanding of this

[14] Accuracy-motivated reasoning refers to reasoning that leads to coherence between information provided to an individual with prior beliefs.

variation more qualitative research enquiring into the nuances of this dichotomy within each religion is necessary. However, it is generally expected that the Abrahamic religions will have greater variation between fellow adherents than the Eastern religions included in the typology.

The evidence from the literature regarding variations in perceived efficacy amongst both religious individuals as well as countries with differing proportions of Christian denominations may have some crossover with this theorised axis. However, with regards to the utilisation of perceived efficacy as a proxy for free-will and determinism, where low feelings of perceived efficacy could indicate a proclivity towards determinism, there are several issues which preclude its usage.

Another important note is that the horizonal and vertical axes are not expected to exert a proportional level of influence on climate change risk perception. In fact, it is expected that the biocentrism/anthropocentrism axis will be amongst the primary effects of religion upon climate change risk perception, while determinism and free will is expected to play a lesser role. This is primarily because of two main factors relevant to the determinism/free will axis. Firstly, the aforementioned intra-religious differences regarding the degree to which humans have agency mean that on average, religious populations are unlikely to differ as significantly when it comes to these perspectives, with population means likely being closer on this axis. Secondly, levels of risk perception are not expected to correlate as strongly with free will or determinism as they are with anthropocentric and biocentric perspectives, with a clear scheme set out above as to why anthropocentrism is expected to indicate lower risk perception.

Factors explored that are not present in the typology have still been considered in the placement of each religion upon the axes. For example, a strong eschatological perspective in Christianity could lead individuals to be more deterministic and anthropocentric. Altogether, however, Christians are expected to lean more towards free will, with a range in terms of belief across individuals globally. Eschatology was not included as an axis due to the fact that it is far more relevant to certain religions than others, and as such isn't expected to represent a fundamental differentiator between global religions.

Non-religious individuals are not included in the typology as while they are included as a group in analysis, their views cannot be said to represent a religion in the sense that there is no cohesive scripture or community that can be said to represent the nexus of their beliefs. However, variation between countries with high levels of non-religious individuals is likely to be of some importance when it comes to analysis of the cultural influence of religious ideology. The high levels of non-religious individuals in countries must nonetheless be analysed in consideration of the cultural influences of historically dominant religions, i.e. Taoism in China, Shintoism in Japan, Christianity in the UK, and Judaism in Israel. Each of these countries have high levels of irreligiosity, though the attitudes of non-affiliated may nonetheless provide insight into the cultural influence of these religions too. This is likely to be particularly pertinent in in religions that do not emphasise membership, such as Taoism and Shintoism in China and Japan, respectively. Therefore, while the category is useful as a measure in analysis i.e. as a reference category and comparison between countries, it nonetheless cannot be fit on a typology pertaining to specific belief structures of particular religions.

2.3.12 Conclusion

Altogether these theoretical expectations provide important understanding and structure moving into the next sections for the second analysis. This section has engaged with several elements of religion that may impact individuals' climate change risk perception, with particular focus upon those factors that may be relevant to several global religions. The relevance of each factor was assessed based upon engagement with literature as well as theoretical expectations. Two main axes with included in the typology, namely a spectrum of anthropocentrism and biocentrism on the one hand, and determinism and free will on the other. These perspectives are expected to play a key role in establishing the differences between religions in terms of their impact on environmental and climate change perspectives, including risk perception. Anthropocentrism/biocentrism is expected to be important as it deals with several fundamental questions including both humanity's distinction from nature and relationship with it. Indeed, Stern et al.'s triad of value orientations highlights prior emphasis on these factors, explicitly in the case of biocentrism.

Perspectives on determinism and free will are also expected to influence climate change risk perception to a degree and have been shown to vary both across and within religions. There appear to be differences between Western/Abrahamic and Eastern religions, with the latter placing emphasis on external factors i.e. Karmic justice and principles relating to detachment and abandoning ego, although deterministic perspectives are prevalent in monotheistic religions in relation to beliefs in divine interventionism. This spectrum in this sense is one that deals with the question of how much control humans have over human and worldly affairs and therefore are somewhat similar to factors including personal and collective efficacy, included in the prior moderation analysis. There is also some cross over between anthropocentrism/ biocentrism and determinism/ free will, with the former possibly influencing perspectives on human agency, i.e. humanity's special place in nature could be considered as one that provides agency and responsibility. Nonetheless, the distinction between the two axes is useful as they target perspectives on environmental ideology and human control, respectively, with elements of interaction between the two.

Eschatology is not included as an axis, though it may play a role in climate change risk perception, and this is down to several reasons. Different eschatological perspectives can be observed across religions, with considerable variation amongst religious adherents of the same faith too. In fact, placing individuals in a typology for eschatology is less viable than those chosen, in part due to this internal variation. A particularly important factor to consider is the interrelation of eschatology and perspectives on free will and determinism. As noted, should an individual truly believe climate change to be in some way representative of the end-times, this would likely be reflected in their perspective on free will, due to the necessary implication that God(s) are incurring the event upon the planet, thus ridding humanity of control. This would require extensive qualitative work to establish and as such must be taken as speculative, though it is an interesting avenue for further research.

Fundamentalism and attendance are both considered as integral to understanding religion's impact on climate change, though this is potentially uneven across different religions. As noted, they are not included in the 2-dimensional axis, though they are expected to influence differences amongst adherents of the same religion on the issues in the typology, as well as

factors such as eschatology. The statements from religious leaders were useful for providing context and did generally map well onto the placements of the religions within the typology, particularly relating to anthropocentrism and biocentrism. However, the overall expected effect of religious leaders is not expected to be particularly influence in the cases of individual attitudes, though this may vary within different countries and denominations i.e. Catholicism.

For country-level factors, Christian majority countries are expected to have the lowest risk perception, particularly relative to Buddhist, Hindu and other Eastern Religion majority countries. This, as explained, is primarily theorised due to the contrasting characteristics of these religions explored extensively above, and the historical influence these religions will have had through centuries of institutional development.

2.4 Moving Forward

This chapter has provided an extensive exploration of the available evidence relating to climate change risk perception, and the sociological and socio-psychological contributors that influence how risk perception emerges and varies across individuals and societies. Throughout this exploration the gaps in the literature and the expectations of the theory of religion were made explicit. From these, broad research questions aimed at guiding the analysis chapters were developed.

1. How does political ideology influence climate change risk perception amongst individuals across countries, and what factors determine the differences between these political ideologies?
2. Does religion play a role in shaping individuals' climate change risk perception across the world, and does this vary across countries depending upon religious demographic and institutional influences?
3. Does postmaterialism meaningfully contribute to climate change risk perception across the world?

These questions refer to the primary contributors to climate change analysed throughout this thesis, but by no means represent an exhaustive list of the questions explored. The factors above were considered primary to this research, however, secondary hypotheses arose

throughout exploratory data analysis and as a result of the theoretical considerations. The relationship between GDP and risk perception was considered early on, however, the interaction between GDP and religious affiliation was identified following the extensive exploration of both the literature and data. Furthermore, the interaction between attendance of religious services and political affiliation was expanded upon in the 28-country analysis following the analysis of Finland, Japan and the United States. The results from the USA in particular wherein Democratic Party affiliated individuals were divided by both religious affiliation as well as attendance, alongside small right-wing parties in Finland, indicated that this was a relationship that may be impactful upon the relationship between politics and risk perception, as well as indicating that the effect may vary across ideological categories depending upon the country. Therefore, the research questions above should be viewed as broad templates that guided each analysis chapter throughout the thesis, as well as the discussion included in Chapter 7. However, they do not serve as an exhaustive list of the topics and themes explored throughout these chapters.

3. Methodology

3.1 Introduction

This section lays out the methodology utilised across 3 analysis chapters, purposed with answering the research questions outlined at the end of the prior chapter. The technical aspects of each method employed are described in detail as well as possible alternative methodologies that have been utilised by researchers in past literature. Further details are then provided for the dataset chosen for the research the International Social Survey Programme (ISSP Research Group, 2023) *Environment IV* country data. Analysis of the dataset itself will follow, including sampling procedures, ethical considerations, weights and then the variables relevant to the analyses. A review of all available and relevant data is also included to show how this data was chosen in line with the research aims. Following this, each analysis chapter is described in more detail, with an emphasis on how the data and methodology will enable each analysis to contribute to relevant debates.

3.2 Methods of Analysis in this Research

The aims of this research are to explore the dynamics of ideological contributors to climate change risk perception, including politics, religion and values, with a particular emphasis on explaining how these factors come to influence both country and world risk perception amongst individuals across various countries. The lack of exploration of country-level variables in prior research, noted throughout the literature review, particularly with regards to religion, also guided the methodological direction taken. Critical understanding of climate change risk perception is an advanced field, although there are plenty of gaps in literature relating to the factors that this research is interested in. Furthermore, analysis of risk perception is an ever-developing field due to the fact that the impact of climate change on individuals' lives, both directly through climate changes as well as its prevalence in national and international discourse, mean that continual analysis with contemporary evidence is necessary. Primary quantitative data collection on this scale is logistically impossible for a PhD research project and would not allow for the scope for project aiming to identify the unique effects of multiple contributors, including aggregate level variables. Therefore, secondary quantitative data analysis is the most appropriate methodology for the purposes of this research. Furthermore,

there are several international quantitative datasets available, meaning there was some capacity to find a survey most in-keeping with the research topics, which are assessed for their applicability to this research below.

While this could be approached from a qualitative or mixed-methods route in many ways and could benefit from more detailed understandings of measurements such as risk perception (Capstick et al. 2015), this research aims to explore comparative impacts of various religions and ideologies across the world. Therefore, international qualitative data fit for comparison would be needed for an alternative methodology. Primary collection of this data is extremely difficult logistically within the timespan and budget of a PhD undertaken by one person. Furthermore, qualitative secondary data of this kind does not exist. There are also several methodological difficulties relevant to this type of research project. These include variability across research contexts, which across countries is a problem due to the difficulties of achieving saturation across a number of countries. Saturation is a core methodological component of qualitative research, which indicates that all themes relevant to the research have been covered to a sufficient degree across a wide range of data, wherein "the research becomes empirically confident that a category is saturated" (Glaser and Strauss, 2017) as no additional data is being found that is relevant to the category relevant to the research (Saunders, 2017). Access to a sufficient amount of data to ensure saturation in a cross-national study would require an enormous amount of work in terms of both sampling and data collection.

3.2.1 Studies using qualitative or mixed methodologies.

Mixed and Qualitative methodologies have been utilised to explore similar questions. Schuman et al. (2018) explored how religious beliefs impact how climate change is perceived in three rural communities in North-West South Africa, looking at perceptions of adaptation in particular, with several conclusions that are relevant to risk perception. This study utilised Q-method to collect data, then analysed recurring statements from semi-structured interviews. Through the use of this methodology, two distinct groups were identified amongst Christians: determinists or fatalists who see climate change as the will of God and thus unavoidable; and those who acknowledge humans' impact on climate change. This study therefore highlights the nuance found amongst followers of Christianity, thereby avoiding over-generalisation of groups

and the ecological fallacy, which could be problematic in certain quantitative analyses. It also provides more context regarding the individuals who fit into each group, with certain fatalists viewing the problem as more naturalistic than those who view it as God punishing humanity. Again, a level of detail and nuance that quantitative data analysis, in particular secondary data due to a lack of control over questions, is unlikely unable to achieve.

Hope and Jones (2014) explore the impact of religion on attitudes to environmental issues and carbon capture and storage technologies through a mixed methods study. The research covers individuals who can be categorised as either Christian, Muslim or Secular, engaging them in separate focus groups and providing a short questionnaire regarding perceptions relevant to the study. Muslim and Christian participants who believe in "a benevolent deity with power to intervene… and in the existence of an afterlife" had overall lower risk perception than secular individuals (ibid: p57). Meanwhile, differences occurred between religions in terms of the prospect of divine intervention – Christians were more likely to trust God with their "ultimate welfare" (ibid: p57). This study again highlights the benefit of semi-structured engagement with research participants, with its detailed coverage of specific elements of religion and how they relate to climate change perceptions. The study also includes a quantitative element with data collected through a questionnaire. The clear drawback of this method is that the nature of the topic is extremely multivariate, meaning effective engagement in a qualitative sense is difficult to achieve. Achieving comparability across countries is far less feasible in this case, due to the multivariate nature of such discussions, with saturation being inherently difficult for cross-country studies. This would require a high allocation of resources not within the remit of this research.

Most studies using these alternative methodologies focus specifically on one element of interest in this research i.e. religion (Schuman et al. 2018; Hope & Jones, 2014). This highlights another strength of this research, wherein multivariate analysis as well as analysis of the relationships between independent variables themselves are achievable. Manifestations of any social phenomena amongst individuals are rarely if ever isolated from the influence of material and ideological influences. Statistical research can attempt to broach these differences within analysis rather than solely deferring to theoretical understandings of these interconnections.

3.3 Data

Table 3.1: Review of Available Data

Data Source	ISSP Environment IV (Hadler et al. 2019)	WVS Wave 5 (2005-09) (Inglehart et al. 2014)	ESS Wave 6 (2016) (ESS ERIC, 2023).	World Risk Poll 2019 (LRF, 2025).
Relevant topics covered/ Measures included	Climate Change risk perception Political Affiliation (left-right scale; party) Postmaterialism Values (Personal and collective efficacy Religion (attendance, denomination) Postmaterial scale Sociodemographic (age; income; education; sex; employment; children) Religion (affiliation; denomination; attendance)	Global warming Postmaterial scale Sociodemographic (age; income; sex; education employment) Religion (denomination; attendance; practices; beliefs)	Climate Change worry/ global impact Political affiliation Media (traditional or internet) Values (individualism/ egalitarianism) Collective Efficacy Sociodemographic (age; income; education; sex; employment) Religion Welfare attitudes	Climate Change risk perception Sociodemographic (age; gender; education; employment; children) Social media usage
Desirable topics omitted	Media consumption	Climate Change Risk Perception/concern	Climate Change Risk Perception/concern Postmaterialism	Religion Political Affiliation
Similar studies using data		Kvaløy, Finseraas & Listhaug (2012)	Smith & Hempel, 2022.	
Countries covered	14 Countries (pre-release) Global	80 Countries Global	23 Countries European countries only	119 Countries Global

3.3.1 Data Selection and Access

Table 3.1 shows the review of available data conducted prior to data selection. The data used in the analysis is from the ISSP IV 'Environment'. After considering the data sources above, this

was deemed as the best for this analysis for a few reasons. Firstly, it covers a majority of the topics that the research questions refer to. Secondly, it is a global survey meaning analysis has greater scope and could help develop more generalisable theory regarding global climate change risk analysis. Finally, the data was recently collected and released for analysis, meaning the research is more likely to produce original findings that have yet to be replicated. The survey data was accessed through GESIS (2023). Some of the data is publicly available at the time of writing, through the partial release. The US data was provided upon request after providing context of the research being undertaken and was later released and standardised by the ISSP into the Environmental IV module.

The outbreak of covid-19 meant that data collection for this type of research was particularly difficult, meaning the deadline for final publication was pushed back several times by the ISSP. Further, the pandemic incurred several delays upon the release of the full dataset, which was released in the summer of 2023.

3.3.2 Partial Release Sampling

The ISSP is made up of samples from each country featured, each collected separated by different teams, with the data collected from each country submitted to the ISSP for review, collation and standardisation. The partial sample, used in Chapter 4, which includes two countries included in the first analysis, contains a total of n=21,718 respondents, The country samples for Japan (n= 1491) and Finland (n=1137) are included in the partial release. The US sample (n=4032) was accessed through General Social Survey (GSS). As each are collected separately, it is important to run through the sampling procedure for each country.

The data from Finland was collected by Statistics Finland between 21/09/2020 – 22/12/2020 (Melin et al. 2021). The sampling procedure used was systematic, drawing from a Finnish population register. The population was sorted according to municipality and time of birth in order to ensure a level of national representativity. The initial sample size was 2,800 with a total of 1,137 valid respondents. This significant number of non-responses led to the researchers applying two weights analysis and sampling in order to correct for non-response

bias (ibid). The weights are based on gender, age groups, NUTS3 regions and municipality type (urban/rural).

The data from Japan was collected by Central Research Services, Inc. between 28/10/2020 – 2/12/2020 (Murata & Okada, 2021). The sampling procedure used is multistage probability sampling. The sample was drawn from the Basic Resident Register. Japan was divided into 13 blocks, based on "region, size of community, and ratio of employed population in tertiary industry" (ibid), with 200 survey spots assigned based on the ratio of each block population. Following this, 12 sample individuals were selected at regular intervals for each 200 spots. The sample size was 2,400 with a total of 1,491 valid respondents. No weights were deemed necessary by the data collators.

The US data was collected by the GSS between 01/12/2020 – 03/05/2021 (Davern et al. 2021). The GSS was resigned significantly from previous years due to the onset of the Covid-19 pandemic, having "several ramifications for sampling, fielding, questionnaire design, data cleaning, response rates, and weights" (ibid, 2021). The sampling procedure used was probability sampling using a stratified un-clustered address sample, primarily administered through mail push-to-web and supplemented by phone calls. Mail push-to-web involves influencing respondents' engagement in an online questionnaire through physical receipt of invitations through mail services (ibid). The method was utilised due to covid-19 making face-to-face interviews through stratified clustered sampling unfeasible. The initial sample size was 27,591 with 4,032 respondents – a response rate of 17.4%. Due to this change in methodology the GSS suggests that researchers include the following statement in their research[15].

There are a few key differences between each country in terms of data collection and sampling that could impact comparative research. For example, Finland's data includes individual respondents aged 15 – 74, while the US and Japan specified 18 upwards. This could impact

[15] Suggested Statement to Include in Articles and Reports That Use GSS Data: To safeguard the health of staff and respondents during the COVID-19 pandemic, the 2021 GSS data collection used a mail-to-web methodology instead of its traditional in-person interviews. Research and interpretation done using the data should take extra care to ensure the analysis reflects actual changes in public opinion and is not unduly influenced by the change in data collection methods. For more information on the 2021 GSS methodology and its implications, please visit https://gss.norc.org/Get-The-Data.

comparisons made between age groups between each country, depending upon how age is coded and measured. In order to allow for comparison, a standardised measure of age across all three countries will be used. This will be outlined later in this chapter.

3.3.3 Full release Sampling

The full sample, used in Chapters 5 and 6, has a total of n=44,100 respondents from 28 countries. The samples for the countries were collected between February 2020 to May 2023. As noted, this window was extended due to the covid-19 pandemic. Sampling procedures utilised were probability based simple random samples or multistage samples. Methods of data collection ranged significantly, from face-to-face interviews, self-administered questionnaires and web-based questionnaires/interviews. The full list of modes of data collection used are available via GESIS (2023).

The weighting procedures across countries varied somewhat, with some countries not including weights. This was addressed by dividing 1 by the number of respondents and applying the figure to each respondent. Furthermore, due to the clustering in multilevel modelling, it is important to ensure that countries are not over or underrepresented in the models. There are two common methods for ensuring this representativity, outlined by (Carle, 2009). The weights for the dataset were scaled due to the large differences in population size across the countries, observable in Figure 3.1.

Figure 3.1 – Countries by sum of weight and population size

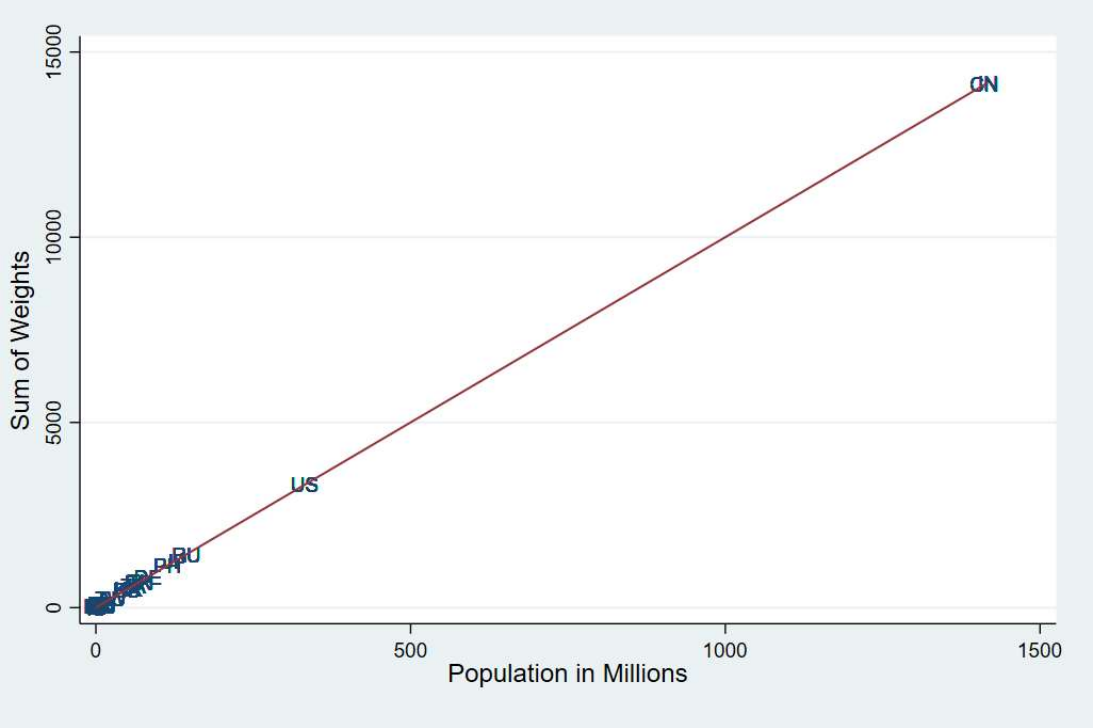


Figure 3.1 shows the weights adjusted to population size to ensure the varying population of countries do not provide over or undersized effects on each model. This means that individuals within countries will be assessed proportionally while still including a survey weight, with China and India at the top due to their large population sizes.

3.3.4 Ethical Considerations

Each of the surveys included several steps to ensure the anonymity of respondents. All surveys used a form of random probability sampling, using national registers, and stratified these through several steps that are shown above in more detail. In all cases, questions were answered through self-administered paper (the sole data collection method in Japan) and web-based questionnaires by participants. No contact forms were used for direct communication with participants. This makes the identification of individuals taking part impossible for anyone outside of the surveyors themselves, meaning anonymity is ensured. The published datasets do not include specific information that could be used to identify individuals. Each ISSP member must comply with the legal requirements of each country, asking questions approved by the

ISSP General Assembly (GA) based on “scientific merit, sociopolitical relevance and ethic appropriateness” (ISSP, 2022). Before the data is deposited to the ISSP Achieve and made publicly available, “ISSP data are anonymized [sic] so that individual survey participants cannot be identified” (ibid).

3.3.5 Previous Studies using the Data

There is one publication using the Finland country data. Juntunen’s (2022) study focuses on the so-called environmental concern paradox relating to concern and behaviour. This paradox, continually noted in the literature and often referred to as the value-action gap, is the common social phenomena wherein individuals may have high levels of environmental concern, though engagement with sustainable behaviour remains low. Ibid (2022) focuses specifically on sustainable consumption and findings confirm this paradoxical relationship. Interestingly, the study also shows that individuals who say they are willing to give up certain habits nonetheless have not made the individual behavioural changes, highlighting a gap between what individuals say and do when it comes to specific behaviours too. This has been explored somewhat throughout the literature review, though behaviours themselves remain a separate issue to the interests of this research. As such, Juntunen’s research is unlikely to hold much relevance to this research moving forward. At the time of writing, there don’t appear to be any studies that have used the Japan or US country data in country-specific studies.

Cross-country analyses have emerged with some relevant to this research. Franzen & Bahr (2024) explored the development of environmental concern across 3 decades. Ibid indicated that individual level environmental concern is dependent upon education, politics and trust in science. Meanwhile, country wealth was the main contributor to differences in macro-level concern. These factors are similar to those explored in this research, though the broad environmental focus of this paper and longitudinal methodology mean its results aren’t directly comparable. Hadler et al. (2024) explored factors relating to environmentalism globally, with some focus on climate change attitudes and behaviours as well trust in social institutions. Ibid restrict their analysis to descriptive statistics of a broad range of attitudes and behaviors and as such don’t venture into many of the questions included in this research.

3.3.6 Linear Regression Analysis

Linear regression analysis is a form of multivariate regression analysis which enables the analysis of the linear relationships between a dependent variable and one or more independent variable. The method assumes the relationships between the dependent variable and continuous independent variables are linear. This methodology is employed for the analysis of 3 countries in Chapter 4, with country and world risk perception included as continuous, dependent variables. The inclusion of multiple independent variables allows for analysis of the effects of each independent variable e.g. age while controlling for other variables e.g. education, sex, etc. Coefficients are interpreted differently depending upon the type of variable utilised. For example, for a continuous variable such as age, the coefficient is the change in the dependent variable per unit of age i.e. one year. The average risk perception of an individual who is 20 years older than the youngest individual(s) (the constant) can be calculated by multiplying the coefficient by 20. For a categorical variable such as sex, the coefficient can be interpreted as the average difference between the first category i.e. men and the second category i.e. women. A positive coefficient would indicate that women have higher risk perception on average than men.

The adjusted R^2 is reported to show how much of the total variation in the dependent variable is explained by the independent variables included. With theoretically sound models, it is expected that the R^2 will increase with the inclusion of more independent variables. The adjusted R^2 is a more conservative estimate of the fit of the linear regression compared to the standard R^2 which tends to be overly optimistic (Chen & Qi, 2023). The final models were corroborated using robust standard errors and ordinal regression (Appendix Tables 9.12 – 9.16).

Moderation

Moderation can be measured through interaction effects, similar to standard regression techniques. This involves adding an interaction term alongside the main effects and then interpreting the coefficient provided in the analysis. The analysis of interaction effects allows for the observation of the effect of one independent variable e.g. attendance of religious services, on that of another's e.g. political affiliation, upon climate change risk perception. For example, right-wing individuals who attend church regularly may indicate lower risk perception

than right-wing individuals who never attend, and thus the effect of political affiliation would be moderated by attendance of religious services. This type of analysis enables greater understanding of the variation within categories e.g. right-wing affiliated or Christian individuals, rather than solely between groups e.g. left-wing affiliated and right-wing affiliated or Atheists and Christians, providing more a more detailed analysis than is possible using only simple linear regression models.

3.3.7 Multilevel models

Hierarchical linear models are utilised in the 28-country analysis, which are forms of multilevel models that, similarly to linear regression analysis, assume linear relationships between the dependent and independent or predictor variables. Multilevel models including random intercept and random slope models allow for the separation of respondents into clusters, which for this research will be countries. Therefore, unlike multivariate regression analysis, this methodology allows for analysis of two levels of analysis – individual and country level – and provides an understanding of the variations both within and between countries. Multilevel models also for the inclusion and analysis of aggregate level variables e.g. GDP per capita, across countries. While these measures are sometimes included in multivariate linear regression analyses, due to the lack of clustering, such models cannot allow for the variation across countries. This emphasises one of the core problems that multilevel modelling can help solve, namely the ecological fallacy, wherein inferences are made about individuals in a population based on group or aggregated data (Munck, 2005). The clustering present in multilevel models enables the proper analysis of both individuals and groups simultaneously. Coefficients can be interpreted in a similar way to those in linear regression models.

Random intercept models

Snijders and Bosker (2012) explain that the group dependent intercept, or constant, varies between groups. In the case of this research, random intercept models allow for an understanding of the variability in risk perception across countries in a single model with the assumption that the coefficients will be equivalent across countries. Table 3.2 shows the variance component model, which is a random intercept model with no independent variables, where the dependent variables are sorted into clusters, in this case countries. The constant can

be interpreted as the expected risk perception score if an individual was randomly chosen from a random country in the sample (ibid). The variation constant shows the variation across countries, and the variation residual shows the variation between individuals within each country. Once independent variables are included, the coefficient of an independent variable can be interpreted similarly to linear regression. However, the random effect term accounts for group-level differences, leading to more accurate standard error estimation compared to ordinary least squares (OLS), utilised in linear regression models. Random intercept models assume that each slope (i.e. the strength of the effect of an independent variable) will be the same across countries. This is a limitation addressed in random slopes models discussed in the next section.

Table 3.2 Variance component model

	Country Risk	World Risk
Constant	6.69* (.11)	7.06* (.12)
Random-effects parameters		
Variation constant	.27 (.07)	.30 (.07)
Variation residual	5.49 (.27)	5.67 (.14)
Likelihood ration (LR) test	23612.3*	22976.3*
Intraclass Correlation Coefficient (ICC)	.05	.06
AIC	153022.8	154866.6
BIC	153048.7	153892.4

The Intraclass correlation coefficient (ICC) shows that 5% and 6% of the variation at the individual level is explained between countries for both country and world risk perception respectively. The ICC is calculated by taking the variance of interest, in the case of this research the variation constant, and dividing it by the total variance (variation constant and variation residual). This null model indicates that multilevel modelling is an appropriate form of analysis for this data, as the LR test indicates a significant difference between the random intercept model and a single-level regression model (Snijders & Bosker, 2012). Here the ICC is equivalent to the Variance Partition Coefficient (VPC), which is an indicator of the variation at each level of analysis. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are both statistics indicating model fit, or how well the distribution of the model is suited to the data. As predictor variables are included e.g. politics, age, education, etc. it is expected that the

model fit will improve i.e. the AIC and BIC will be lower (Leitner & Turner, 2017). The R^2 reported is the Snijders/Bosker R-squared (1994). This separates the variation explained by the model into the two levels in the analysis, individual and country-level. Snijders and Bosker (2012) emphasise some of the difficulties associated with explaining the proportion of variance in hierarchical linear models, including the possibility for negative R^2 values which can be indicative of model misspecification. This issue can be addressed partly through analysis of each level-2 variable and how their inclusion in larger models impacts the explained variation, which are both discussed in the analysis chapters.

Random Slopes

Following this, random slope models are utilised, enabling for the measurement of the variation in coefficients across countries which is necessary due to the phenomenon of heterogeneity of regressions across groups (Snijders & Bosker, 2012). The decision to allow for random slopes for particular variables e.g. political affiliation is determined primarily through theoretical consideration, where more extensive analysis of how a contributor's effects vary from one country to the next. In practice, this means that both the intercept, or constant, and the slope, or strength of the effect, of a particular variable can be accounted for across countries (ibid). For example, the likelihood of individuals in different countries to be influenced by political affiliation in the same way is very low. A random slopes model can allow for variation across countries for political affiliation (Heisig & Schaeffer, 2019), with different effects for each group (in this case countries) and therefore enable analysis of the country-specific effects of political affiliation, akin to those obtained in the linear regression models in the 1st analysis for example, in a single model (Pillinger, 2025). The model includes a coefficient for the variation of the included random slope alongside the constant and residual variation. This allows for the discussion of individual countries as well as how countries vary in comparison to one another with regards to the effects of specific explanatory variables.

Cross Level Interactions

Cross level interaction terms allow for the testing of moderation between an individual-level variable e.g. political affiliation and an aggregate level variable e.g. GDP per capita. These

interactions include random slope terms for the individual-level variable to enable variation across countries as outlined above. The cross-level interaction coefficients can be interpreted similarly to moderation in linear regression analysis.

3.3.8 Limitations and important considerations

The establishment or proposal of causal mechanisms is a desirable aim in social science research. However, it is vitally important to understand the limitations present in any and all methods of social research. This research, which aims to understand the relationships between variables as well as their interactions with regards to their effects on risk perception, is designed to provide important analysis with the possibility of illustrating moderating effects between the specified variables.

The dataset used is cross-sectional and therefore the empirical claims made must be considered carefully, due to the fact that the temporal links between variables can't be established in the same way that a longitudinal study could, for example.

Contextual factors not captured by the variables included must also be considered. Many of the samples included in the dataset were collected during the Covid-19 pandemic and related lockdowns. This may have influenced individual's responses on many issues, with the increased attention placed upon global health issues and the power of the state potentially amplifying individuals' climate risk perception, for example (Pidgeon et al. 2010).

The use of secondary data generally incurs several limitations, some of which will be relevant to this research project. As observable in the review of available data below, there are limitations on the number of variables that are either perfectly suited to the research aims or available within secondary survey data at all. The lack of control over the questions asked and data collected naturally places limitations on the possibilities of producing data that meets this research's aims completely. For example, questions related to religion could feasibly have been analysed through a latent construct comprising of multiple questions relating to specific aspects of religiosity i.e. attendance, beliefs, practices. This is potentially helpful as it enables researchers to capture a broader concept within the research itself, rather than the concept's related individual components. Nonetheless, the benefit of being able to cover 3 countries with

large-N samples and questions standardised across all countries highlights the strengths of this methodology despite these shortcomings.

The above limitation also applies to the set of countries contained in the dataset, which similarly impacts the scope of the analysis. The theory of religion outlines a typology that places religions upon two theorised axes. However, due to the countries included in the dataset, the majority religions were restricted to Christianity, Buddhism and Hinduism. Greater control of the samples would have provided a greater capacity to undertake empirical analysis more in line with the theoretical expectations. Another related aspect of this limitation pertains to the use of multilevel modelling. The dataset being restricted to 28 countries incurred limitations with regards to aggregate variables, where Hinduism and Buddhism were combined into an Eastern Religions category, due to India being the sole Hindu majority country. This once again limits the scope of the analysis as well as the specificity with which the findings of the analysis can be applied to the theory. A 28-country sample is on the lower end of recommended clusters for multilevel modelling, with the above limitation highlighting the difficulties of complex sociological analysis with this methodology.

Pooling data together across 28 countries runs the risk of oversimplifying the differences between countries, however, multilevel modelling provides a framework to analyses the variation of effects across countries. These considerations are nonetheless kept in mind throughout the analysis and discussion of the results.

It is also important to consider the linguistic differences that may arise from asking standardised questions across several countries with distinct languages. The ISSP (2018) outlines recommendations for teams from each country should follow with regards to translation. A core group sets a standard questionnaire in “British” English and then two-step approach is generally undertaken. Firstly, translation is undertaken by “at least two individuals” as a minimum rule (ibid). Translation teams should aim to utilise expertise in the areas of “translation and survey methodology/questionnaire design”, while also identifying areas appropriate for cultural adaption, if necessary, and will notify the core group of changes in the documentation. Therefore, the process outlined by the ISSP is fairly robust, and allows experts

to engage in adaptation of the questions should linguistic variation necessitate. However, this is a clear limitation of cross-country analysis using secondary data, as interpretation of each question may vary both within communities of shared languages but also across countries with distinct languages.

There are also potential issues for operationalisation beyond translation, where the use of survey data to measure abstract concepts and latent variables can also become problematic. For example, the dependent variable of risk perception can capture other interrelated yet distinct metrics utilised in studies about worry, fear and concern. As noted throughout the literature review the distinctions between these concepts are continually reassessed as research is undertaken, and part of clarifying the distinctions between these concepts is dependent upon clearly articulated questions. In the case of the dependent variable, discussed in the next section, it could be argued that the language could be modified slightly in order to place more explicit emphasis on the concept of risk, perhaps using elements identified in risk analysis literature (Farrokhi et al. 2020). There are clear strengths of this measure too. For example, its lack of explicit emphasis on personal affect can be seen as a benefit for its capturing of risk as opposed to the interrelated concepts noted above. Nonetheless, this represents a limitation of analysis based on secondary data to a larger degree than studies where direct input on the survey is possible.

3.4 Variables

3.4.1 Preparing Data for Analysis

The two questions posed in the survey that are used as a measure for climate change risk perception:

1. On a scale from 0 to 10, how bad or good do you think the impacts of climate change will be for the world as a whole? 0 means extremely bad, 10 means extremely good. (Hadler et al. 2019: p8).
2. On a scale from 0 to 10, how bad or good do you think the impacts of climate change will be for [COUNTRY]? 0 means extremely bad, 10 means extremely good. (ibid).

The dependent variable of climate change risk perception is made up of two measures, risk perception on the respondent's country and on the world generally. These two measures are kept separated, as the expectation is that they will differ in overall outcomes and that the factors included will influence these outcomes in different ways. The order of the scales for these measures is reversed i.e. 0 originally indicated the highest risk perception and was changed to 10 in order to make the measure more intuitive to understand. The individual level variables are based on the questionnaire included in the Environment IV module (EIV) (Hadler et al. 2019) and background variables questionnaire (BVQ) (Edlund et al. 2023). Each independent variable is outlined in table 3.3, with the exact wording of the question they are drawn from. The following sections show how they were coded in each analysis and show the sources for the aggregate level variables included in Chapters 5 and 6.

Sensitivity analysis was performed including tests for VIF and multicollinearity. These tests showed low to moderate collinearity, with a mean of 1.98 for country risk and 1.97 for world risk, with none coming close to exceeding a value of 10. Ordered logit models corresponding to several linear models in the main analysis (M1, M2, M12 & M23) were also undertaken to ensure that results did not significantly vary with an ordinal dependent variable, with similar results identified in these models (Appendix tables 9.12 – 9.16). Below is an example of linear and logistic predicted plots from the original analysis and sensitivity analysis that followed showing the results indicate the same relationship between politics and postmaterialism, with slightly different effect sizes as is expected across different models (Figure 3.2 & 3.3). The figures (3.4 & 3.5) for GDP and religious affiliation similarly indicate a slightly stronger trend for non-religious individuals in the ordinal regression, with a larger difference between non-religious individuals in lower-income countries compared to higher-income countries. Figures 3.5 and 3.6 show similar results for the interaction between majority religion and political affiliation, with very slight differences in the predicted risk perception for each category.

Figure 3.2 – Linear predicted plots for politics and postmaterialism on world risk perception

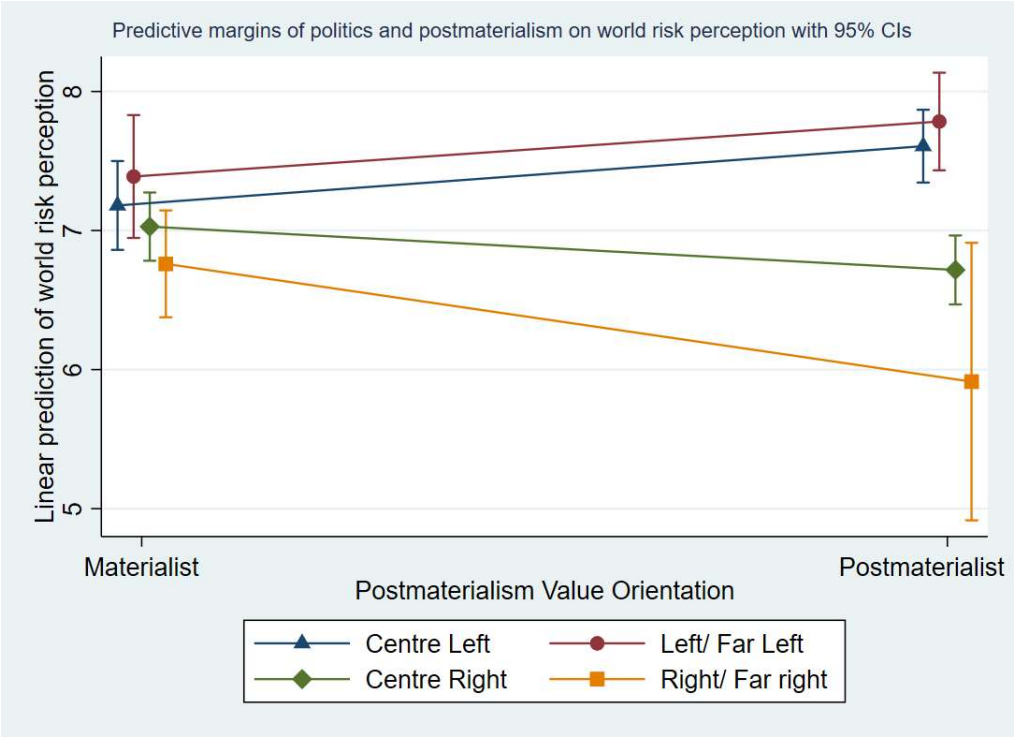


Figure 3.3 –Predicted values plots for politics and postmaterialism on world risk perception with ordered logistic regression

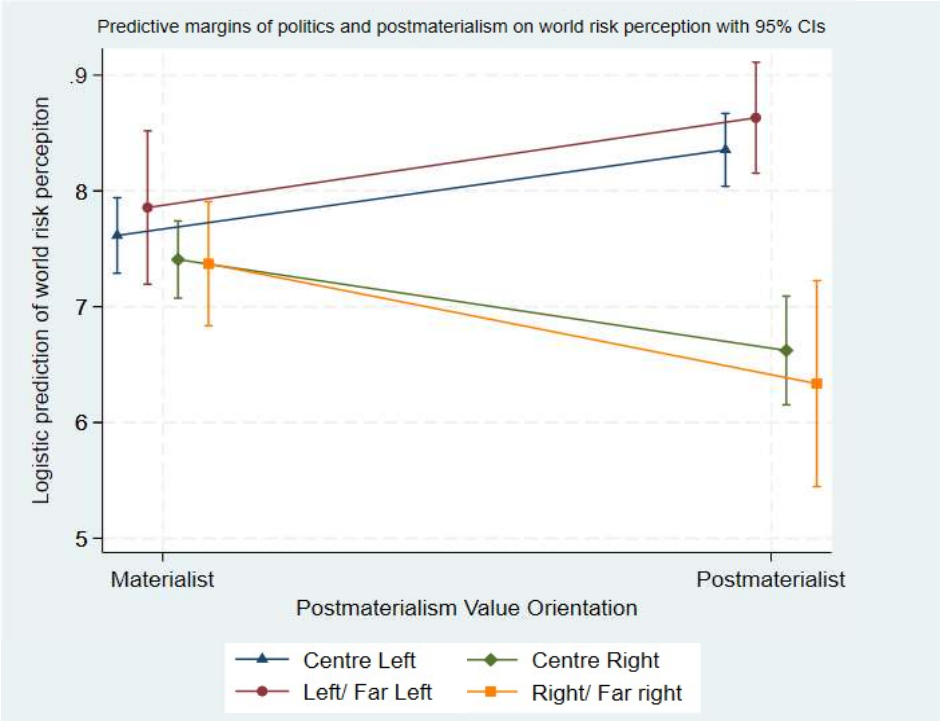


Figure 3.4 – Linear predicted plots for GDP and Religious Affiliation on world risk perception

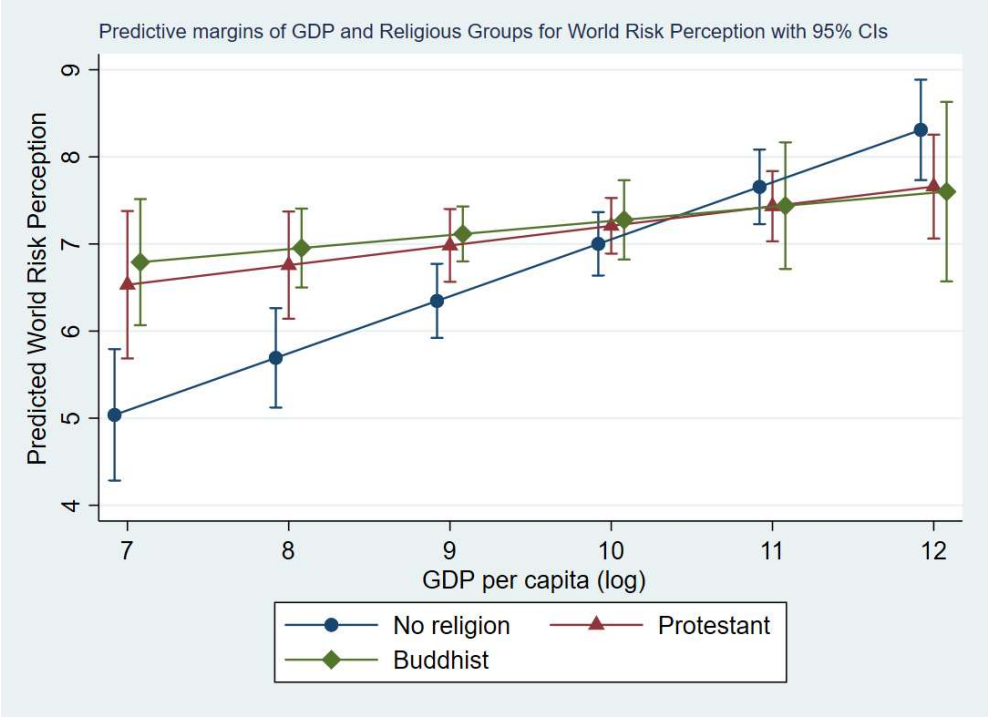


Figure 3.5 –Predicted values plots for GDP and Religious Affiliation on world risk perception with ordered logistic regression

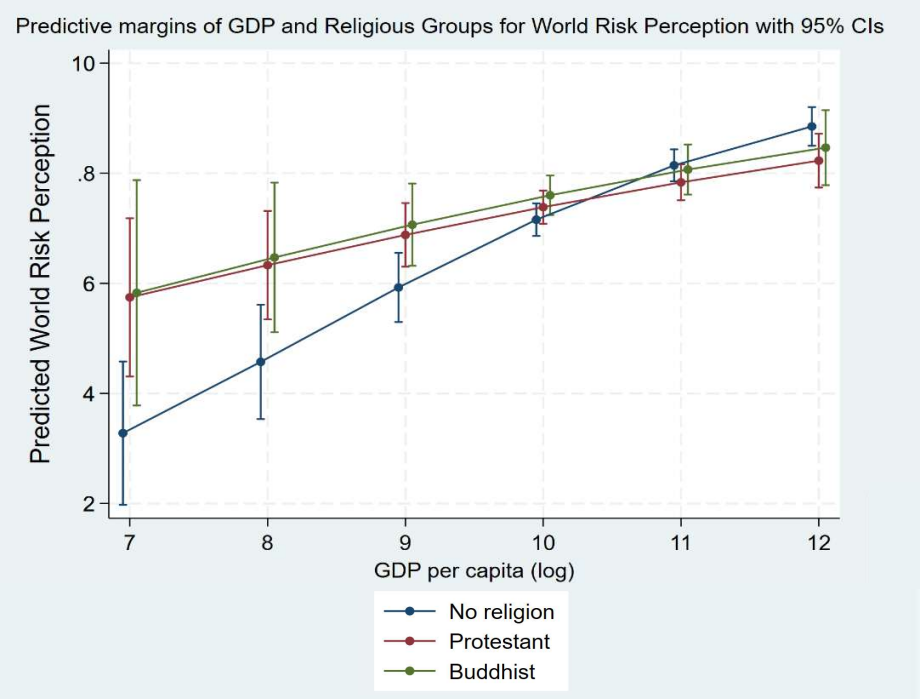


Figure 3.6 – Linear predicted plots for Political Affiliation and Majority Religion on world risk perception

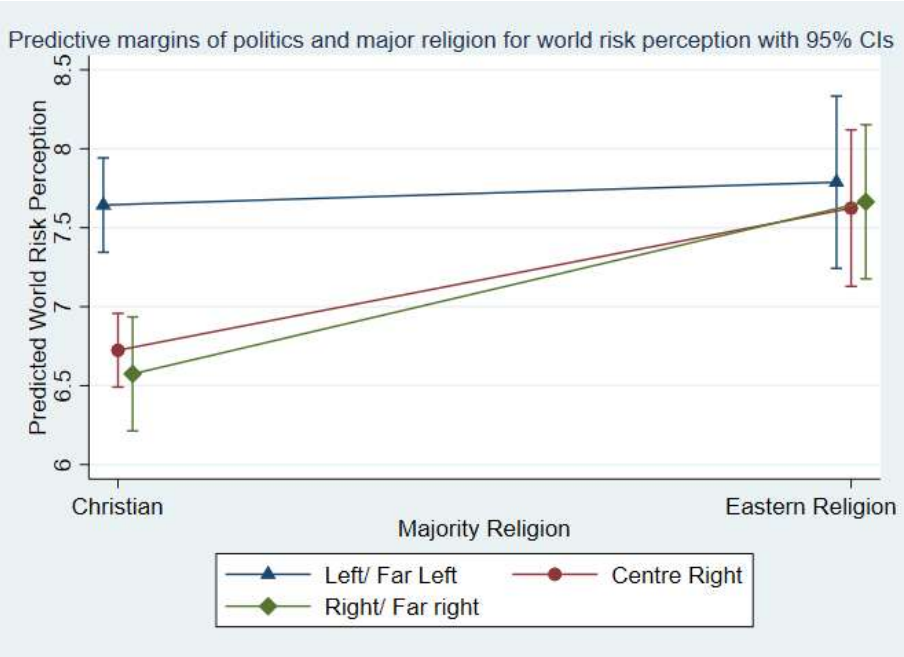


Figure 3.7 –Predicted values plots for Political Affiliation and Majority Religion on world risk perception with ordered logistic regression

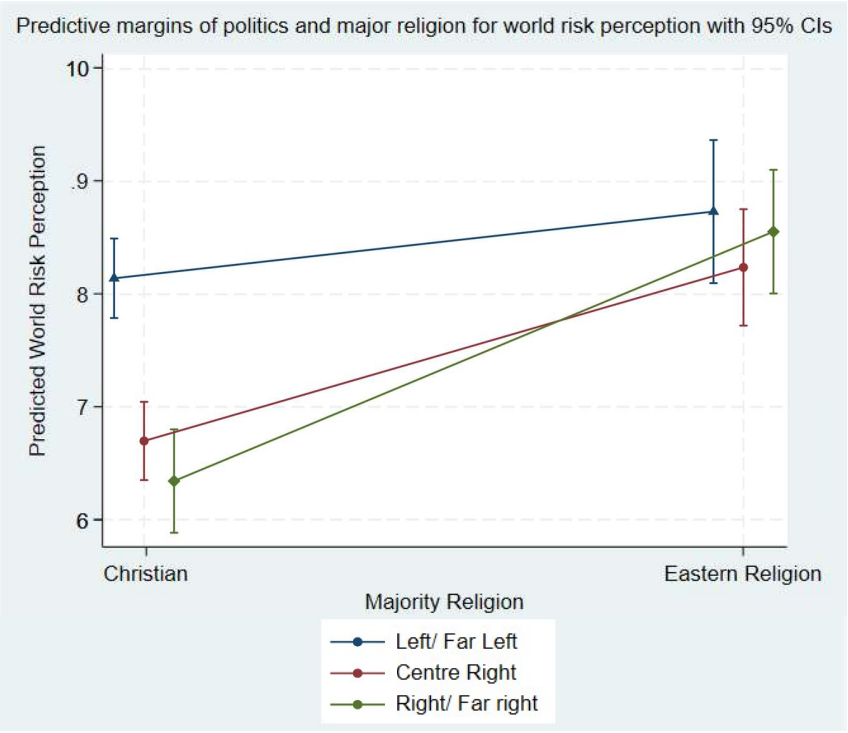


Table 3.3 – Source questions of each ISSP Environment IV variable and units of analysis

Variable name	Source question	Original Coding
Political Affiliation (BVQ)	[Thinking back to the last general election in [month/year].] Which party did you vote for?	Country specific list of political parties, including 'other' and 'didn't vote'. Coded by Hadler et al. (2023) into ideological categories i.e. left/ far left, centre-left, centre-right, centre-right & right/far right.
Religious Affiliation (BVQ)	Do you belong to a religion and, if yes, which religion do you belong to?	Country specific list of religions, including 'other'. Coded by Hadler et al. (2023) into comparable categories.
Attendance of Religious Services (BVQ)	Apart from such special occasions as weddings, funerals, etc., how often do you attend religious services?	1. Several times a week or more often 2. Once a week 3. 2 or 3 times a month 4. Once a month 5. Several times a year 6. Once a year 7. Less frequently than once a year 8. Never
Postmaterialism (EIV)	1. Looking at the list below, please tick a box next to the **one** thing you think should be [**COUNTRY'S] highest priority**, the most important thing it should do. 2. And which **one** do you think should be [**COUNTRY'S**] **next highest priority**, the second most important thing it should do?	1. Maintaining Order in the Nation 2. Give people more say in government decisions 3. Fight Rising Prices 4. Protect freedom of speech 5. Can't choose
Personal Efficacy (EIV)	It is just too difficult for someone like me to do much about the environment.	1-5 Likert Scale from Agree Strongly to Disagree Strongly.
Collective Efficacy (EIV)	There is no point in doing what I can for the environment unless others do the same.	1-5 Likert Scale from Agree Strongly to Disagree Strongly.
Sex (BVQ)	Are you…	1. Male 2. Female
Age (BVQ)	When were you born?	15-103 years old
Income (BVQ)	Before taxes and other deductions, what on average is your own total monthly income?	Country specific salary bands or individual incomes as a continuous variable.
Education (BVQ)	What is the highest level of education that you have completed?	Country specific categories. Coded by Hadler et al. (2023) into comparable categories: 1. No Education 2. Primary Education 3. Lower Secondary Education 4. Upper Secondary Education 5. Post-secondary Education / 6. Short-cycle tertiary Education 7. Lower tertiary Education (BA) 8. Upper tertiary Education (MA) 9. Post-tertiary Education (PhD)

Analysis 1 (Chapter 4): *An analysis of individual level contributors to climate change risk perception in Finland, Japan and the United States.*

Since the research is focused on analysis of the outcomes in 3 separate countries, the separate US data poses less of a problem as there is no need to manually combine the US data with the partial release of the ISSP Environment IV data. Comparative work can be undertaken following the analysis of each country in isolation.

The data provided by the ISSP (Hadler et al. 2019) is generally well coded for analysis, however some changes were made in order to account for comparability across countries, theoretical standards from the literature, sample sizes, and missing data. The analysis chapter begins with the univariate analysis of each variable included.

The dependent variable of climate change risk perception is made up of two measures, risk perception on the respondent's country and on the world generally. These two measures are kept separated, as the expectation is that they will differ in overall outcomes and that the factors included will influence these outcomes in different ways.

In order to adequately assess the impact of postmaterialism, two variables which pertain to the highest and 2nd highest priority of an individual were recoded to enable categories based on conditions relating to an individual's choice of priority. The postmaterialism index includes 4 priorities included: 1. protecting freedom of speech, 2. giving people more say in the government, 3. fighting rising prices and 4. maintaining order in the nation. If an individual picked 1 and 2 as their answers to the two questions, regardless of order of preference, they would be categorised as postmaterialist. If an individual picked 3 and 4 then they would be categorised as materialist. If an individual picked a combination of either 1 or 2 and 3 or 4 then they would be categorised as neither. This enables analysis of this contributor in-line with theoretical standards outlined by Inglehart (1971) and allows for comparison with past studies.

The income variable for all 3 analysis chapters was coded into quartiles. These included lower quartile, lower middle, upper middle, and upper quartile. 'No answer/ refused' was also

included due to the fairly large number of individuals who did not answer this question. This provided comparability across countries.

Analysis 2 (Chapter 5). ***Understanding the influence of individual and aggregate level measures of religiosity on climate change risk perception across 28 countries****.*

This chapter utilises hierarchical linear models, with an initial random intercept model highlighting the individual-level effects for the 28 countries. Random slopes will then be utilised to explore the variation of the effect of religious affiliation and attendance of religious services on climate change risk perception across these countries, enabling comparison to the previously outlined theoretical expectations. 2-level random intercepts with the aggregate level variables outlined below provide context for the between-country variation with an emphasis on majority religion and GDP per capita. These moderating effects of GDP will then be further analysed in cross-level interactions with religious affiliation, which was also identified in the theory section as a potentially important relationship in shaping climate change risk perception. The cross-level interactions include random slopes for the individual-level variables e.g. religious affiliation. The prior random slopes are removed in order to ensure model convergence.

The variables in the full dataset were recoded to be consistent with the partial release data used in the 3-country analysis where appropriate. For example, income variables were coded into quartiles once again. Furthermore, the US GSS data was incorporated into the full dataset and coded consistently with the other countries by Hadler et al. (2019), which was helpful due to the nature of multilevel analysis.

As the political affiliation variable was standardised to allow for comparison across countries, the variable now includes categories relating to the traditional political spectrum from left/far left to right/far right, with centre and centre-left/right in-between. Missing data was recoded to include a category for didn't vote/refused since for many countries this accounted for a large proportion of the population.

Aggregate level variables were all manually coded into the dataset, with some being proportional or aggregated measures produced from the individual level variables e.g.

percentage of Christians was a recode of the religious affiliation variable included in the dataset. Majority religion was based upon each country's largest religious denomination, with this also being contingent upon the historical role of each religion in each country, should there have been a radical shift in religious demographics in any country recently. For example, China is primarily irreligious now, however, its historical roots in Buddhism/ Daoism were considered as vital to the development of its contemporary society. Further, secularism, atheism, and/or irreligiosity do not prescribe comparable ideological legacies and as such were not considered a suitable categorisation for the aims of this research.

Aggregate variables including GDP were produced using secondary data that was collected as close to the time of the sample in order to provide the best possible representation of these measures. GDP was collected from the World Bank (2024a). Fundamentalism measures were collected from Pew Research Center (Majumdar & Crawford, 2024). Aggregate control variables were utilised including Climate Risk Index (Eckstein, 2021), Climate Change Performance index (Burck et al. 2020), and Emissions (GCB, 2021). Population sizes were also collected (World Bank, 2024b), which were used to scale the weights as shown earlier in this chapter.

***Analysis 3 (Chapter 6)**: Understanding the effect of political affiliation and its associated mechanisms on climate change risk perception across 28 countries.*

This chapter will utilise random slopes models to identify the variation in the effects of political affiliation across countries, followed by extensive analysis of the mechanisms that shape these effects with both individual and cross-level interactions added to the random slopes models. This analysis chapter proceeds similarly to analysis 2. The univariate and bivariate statistics of individual level included in chapter 5 are relevant to this chapter too. Aggregate level variables from external sources are the same as above. Proportion of postmaterialists, materialists, right-wing affiliated and religious attendees are recodes of the individual-level variables.

These analyses were completed using Stata and the ML packages MEGLM and MIXED.

4. An analysis of individual level contributors to climate change risk perception in Finland, Japan and the United States.

4.1 Introduction

This chapter presents the empirical analysis of climate change risk perception in Finland, Japan and the USA. This analysis is purposed with understanding the contribution of politics, postmaterialism and religion in these countries. This begins with bivariate analysis of both the country risk and world risk dependent variables with all independent variables using ANOVA and T-tests[16] for categorical variables and Pearson or Spearman correlations for continuous or ordinal variables, respectively. Each country is represented in a single table to allow for comparability in the analysis of the results. Following this, linear regression is undertaken for country and world risk perception, the two dependent variables used in this thesis. The results for each model are analysed below, with a particular focus on the association between political affiliation, religion and risk perception.

The linear regression analysis aimed to test some expectations discussed in the prior sections relating to individual-level religiosity. These include testing the disparate influence of religions in two main regards: distinct religions within countries and their influence on climate change risk perception amongst individuals in the same society; and, where possible, how religions compare cross-nationally i.e. Christianity in the 3 different countries. Attendance of religious services is also an important measure as it enables understandings of the impact of social and cultural dimensions of religiosity in each country, with expected differences within religions themselves, between those who attend services regularly and those for whom this is less common. This measure proved to be of particular interest in the USA and Japan, where contrasting effects were noted. The positive effects in Japan helped refine the theoretical expectations for the 28-country analysis to follow.

Political affiliation and moderating factors are a primary focus, with the expectation that levels of politicisation of climate change, and indeed political division more generally, is likely to vary substantially across countries, which will likely be reflected in the variation between individuals'

[16] T-statistic used presented in the case of the Sex variable as this has two categories.

risk perception as influenced by their political affiliation. With generally high-risk perception across most high-income countries, the expectation is that only political parties that have taken explicitly denialist, skeptical, or apathetic positions will reflect upon their voters'/members' climate change risk perception. Literature outlines the moderating effect of religion upon Democrats in the US (Arbuckle, 2017) and this chapter aims to develop upon this relationship and observe whether this effect is present in other countries with varied political and religious environments. Further factors relating to political affiliation are explored across the 3 countries, including attendance of religious services and postmaterialism, in order to further explain the fairly high variations in risk perception within different populations and the phenomenon of lower risk perception amongst conservative/right-wing populist parties (Kulin & Sevä, 2024). The moderation of right-wing individuals in Finland provides important context for the role of religion in highly secularised countries, implying a different mechanism in effect to that within the United States.

4.2 Univariate and Bivariate Analysis

4.2.1 Univariate Analysis

The distributions for the dependent variables are included below. The results indicate relatively consistent risk perception across the 3 countries, though Finnish individuals indicate a lower mean world risk perception at 6.6 (Figure 4.2) while having the highest mean country risk perception at 7.7 (Figure 4.1). Japanese and American individuals have relatively similar country and world risk perception, with both measures at 7.4 for Japanese individuals and 6.9 country

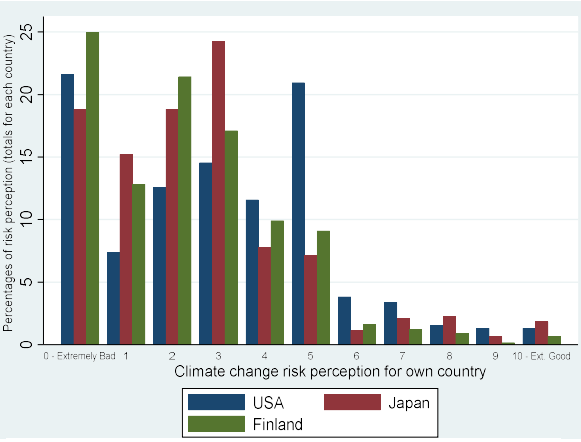


Figure 4.1 – Finish, Japanese and American individuals' climate change risk perception in their own country.

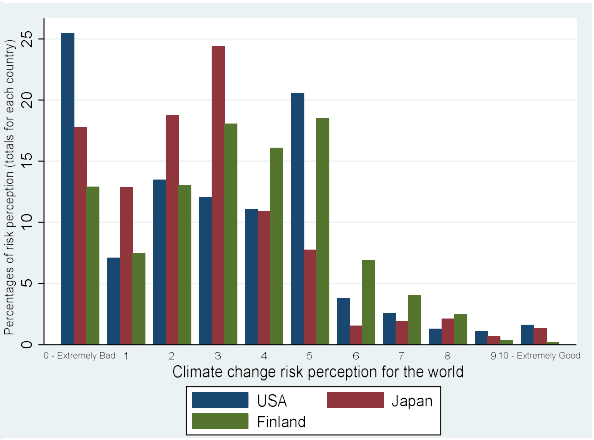


Figure 4.2 – Finish, Japanese and American individuals' climate change risk perception for the world.

risk and 7.1 world risk for American individuals. Tables for univariates including the dependent and independent variables are included in the appendix (Table 9.4 and 9.5). There is substantial variation within the 3 countries from 0-5 risk perception, while few perceive climate change as an insubstantial risk (6-10).

4.2.2 Bivariate Analysis

Table 4.1 – Bivariate analysis results between dependent variables of country risk perception and world risk perception and independent variables across 3 countries.

		Country Risk Perception			World Risk Perception		
		ANOVA F-statistic/ T-statistic[1]	Pearson/ Spearman	R^2	ANOVA F-statistic/ T-statistic	Pearson/ Spearman	R^2
Finland	Political Affiliation	14.2*		13%	17.4*		15%
Japan		1.93		2%	1.7		1%
United States		148.6*		24%	182.5		27%
Finland	Political Ideology	11*	-.31*	1%	10.6*	-.36*	2%
Japan		2.5	-.15*	0%	1.61*	-.16	0%
United States		296.4*	-2.18*	20%	362.9*	-2.39*	24%
Finland	Religious Affiliation	0.23		0%	2		1%
Japan		0.41		0%	0.9		0%
United States		15.4*		7%	13.8*		6%
Finland	Attendance of Religious Services	3.3*	.06*	1%	7.9*	.09*	1%
Japan		2	.04	0%	10.2*	.08*	1%
United States		7.9*	.15*	3%	20.1*	.14*	3%
Finland	Postmaterialism	3.6*		1%	5.4*		1%
Japan		4.6		1%	8.7*		2%
United States		0.1		0%	0.1		0%
Finland	Personal Efficacy	13.7*	.42*	4%	13.7*	.45*	5%
Japan		16.9*	.26*	2%	16.9*	.35*	4%
United States		29.1*	.48*	4%	29.1*	.47*	4%
Finland	Collective Efficacy	21.2*	.55*	7%	68.6*	.49*	6%
Japan		7.3*	.06	0%	.80	.07	0%
United States		18.4*	.53*	5%	51.1*	.53*	5%
Finland	Sex (T-test)	3*	.41*	1%	2.5*	.31*	1%
Japan		1.9	-.10	0%	-1.2	-.07	0%
United States		0.3	.04	0%	.7	.11	0%
Finland	Age		-.03*	5%		-.02*	3%
Japan			.00	0%		.00	0%
United States			-.01*	1%		-.01*	1%
Finland	Income		-.10	0%		.03	0%
Japan			.00	0%		.00	0%
United States			.02*	1%		.02	1%
Finland	Education	2.2	.08*	1%	5.3*	.12*	2%
Japan		3.3*	.08*	1%	2.9*	.08*	1%
United States		6.4*	.17*	3%	6.2*	.15*	2%

Source: Author's calculation using ISSP Environment IV data (2023).
[1]Used for Sex for its 2 categories.
Weighted results
**<0.05 P-value.*

Political Affiliation

The results for political affiliation indicate significant and large effect sizes in both the United States and Finland. This is in line with the literature regarding the United States, with an indication that political affiliation is very important to understanding both country and world risk perception the country. The large amount of variation across the United States (148.6 and 182.5) indicates that there will be large differences between US citizens based upon political affiliation in the multivariate analysis. Finland also has a relatively large R^2 (explaining 13% of the variation in country risk perception and 15% in world risk perception) meaning its impact may also be large, though the smaller amount of variation observed in the ANOVA indicates that the differences across affiliation will not be as notable as in the US. In contrast, the political affiliation does not appear to play a substantial role in determining country or world risk perception for Japan.

Religious Affiliation and Attendance

The results for religious affiliation indicate that the USA is the only country where religion plays a significant role for climate change risk perception (R^2 = 6% for country risk, 7% for world risk). It may play a small role in Finland, though the variation explained is very low (0% and 1%). In Japan, religion doesn't seem to contribute to varied risk perception at all.

Religious attendance meanwhile may be an important contributor across the 3 countries. For country risk, the USA and Finland indicate a significant effect – in the US (R^2 = 3%) and for world risk perception the effects are similarly large for Finland and the USA, as well as indicating some effect in Japan.

Postmaterialism

Postmaterialism may play a small role in Finland and Japan, with significant effects on both country and world risk perception in Finland, and evidence that it may have a small influence world risk perception in Japan (R^2 = 2%).

Personal and Collective Efficacy

Personal efficacy shows consistent association with country and world risk perception, with strong associations and substantial variation explained, suggesting that an individuals' perception of the importance of their own actions is important cross-culturally. This is not so much the case with collective efficacy, which emphasises the importance of acting only when others do the same, wherein Finland and the USA once again differ from Japan, as with political affiliation. The rounded R^2 for Japan is 0% in both cases, indicating that collective efficacy doesn't play a role in shaping country or world risk perception. Meanwhile, collective efficacy appears to play an even greater role than personal efficacy in Finland and the United States in terms of its impact on risk perception.

Sociodemographic Measures

Finland is the only country out of the three where sex appears to have any impact, though the R^2 is 1%, while Japan and the USA indicate no effect. Age is another measure where Finland and the USA differ from Japan, with results indicating age is an important indicator of climate change risk perception, with younger individuals tending to have higher risk perception than older individuals. This is a particularly pronounced effect in Finland when it comes to world risk perception (R^2 = 5%). Income may play a small role in the USA for country risk perception, though its relevance doesn't appear to be substantial across the 3 countries. Education appears to be an important contributor to risk perception, with significant and strong associations across the 3 countries, though the R^2 are generally quite low.

Conclusion

Altogether the bivariate analysis emphasises some significant results across the 3 countries, while also showing substantial asymmetry. In general, there are similarly associated trends between country and world risk perception, with some exceptions noted above. The results indicate some distinction between Japan from Finland and the USA. For example, the impact of politics appears substantial in the USA, as well as Finland, while being unimportant for Japan. This is true for collective efficacy and age too. There appears to be an important impact for postmaterialism on world risk perception in Japan, with small effects for Finland too. Religion in the US appears to have a unique relationship with climate change risk perception, while Finland

and Japan are relatively unimpacted by religious affiliation. Education, personal efficacy and religious attendance are measures that are important in all three countries analysed, showing that there is some evidence of common contributing factors. Nonetheless, there is substantial variation across the 3 countries in terms of the factors contributing to climate change risk perception.

4.3 Multivariate Analysis

This section includes the linear regression models for the 3 countries, with tables for country risk, world risk and then separate interaction effect tables for the 3 countries. The political affiliation variables are included at the bottom of the tables. The inclusion of this measure does decrease comparability somewhat due to the fact each set of political parties is entirely country specific and thus vary as individual categories as well as when considered as part of a country's overall political landscape/ideology. Nonetheless, they were considered important to the analysis due to the overall impact of political affiliation as an explanatory variable. Furthermore, it enabled more extensive analysis of the characteristics of each political party, with the identified importance of right-wing populism as a driver of climate change scepticism noted in the literature being a primary example of how this approach allows for nuance throughout the discussion.

The interaction models for Finland and Japan between political affiliation, religious affiliation and postmaterialism, which are included for the USA, are included in the appendix. This is because the results did not indicate any significant relationships and as such were not included in the main body or discussion of results.

Table 4.2 - Linear Regression results for Country risk perception across 3 countries

	M1 - Finland	M1 - Japan	M1 - USA
Religion (No Religion)			
Evangelical Lutheran/ Protestant	.04 (.17)		-.55* (.18)
Other Christian	-.09 (.49)	.03 (.29)	-.65* (.31)
Christian			
Buddhism	-1.01 (2.10)	.13 (.14)	.34 (.61)
Shinto		-.29 (.42)	
Jewish			-.09 (.47)
Catholic	.46 (.81)		-.25 (.19)
Attendance of Religious Service (Never)			
Once a month or less	-.12 (.15)	.05 (.18)	-.21 (.16)
More than once a month	-.08 (.37)	.64* (.29)	-.54* (.18)
Postmaterialism (Materialist)			
Postmaterialist	-.01 (.22)	.58* (.23)	.21 (.21)
Neither	.04 (.18)	.28 (.17)	.31 (.18)
Personal Efficacy (Strongly Agree)	.06 (.07)	.22* (.06)	.28* (.20)
Collective Efficacy (Strongly Agree)	.46* (.07)	-.10 (.06)	.35* (.17)
Age	-.03* (.00)	.01 (.00)	-.02* (.00)
Sex (Male)	.05 (.13)	-.12 (.13)	-.06 (.13)
Education (Upper Secondary/High school (US))			
Primary			
Lower Secondary (*less than high (US)*)	.29 (.24)	-.47* (.23)	-.26 (.21)
Post-Secondary, non-tertiary	.09 (.19)	.21 (.19)	-.30 (.17)
Short-cycle tertiary			
Lower tertiary (BA)	.08 (.20)	.26 (.16)	.30* (.18)
Upper tertiary (MA) *(& Post-tertiary in US*)	.36 (.21)	-.24 (.39)	.63* (.32)
Post-tertiary (PhD)	.55 (.49)	-.08 (.60)	
Income (Yearly, Quartiles)			
Lower Middle	.10 (.19)	-.03 (.19)	-.26 (.20)
Upper Middle	.24 (.20)	.06 (.19)	-.30 (.17)
Upper	-.23 (.22)	-.04 (.21)	-.28 (.18)
Didn't Answer	.31 (.24)	-.23 (.27)	-.38 (.32)
Political Affiliation (Social Democratic Party)			
True Finns (PS)	-.42 (.28)		
National Coalition Party (KOK)	-.21 (.26)		
Centre Party of Finland (KESK)	-.79* (.29)		
Green League (VIHR)	.68* (.27)		
Left Alliance (VAS)	.61 (.34)		
Swedish People's Party (SFP/RKP)	-.66 (.42)		
Christian Democrats (KD)	-.83* (.46)		
Other Party	.85 (.56)		
Refused/Didn't vote	-.41 (.23)		
Political Affiliation (Liberal Democratic Party)			
Constitutional Democratic Party		-.11 (.21)	
Democratic Party For The People		-.06 (.49)	
KOMEITO		-.40 (.36)	
Japan Innovation Party		.22 (.32)	
Japanese Communist Party		.38 (.33)	
Social Democratic Party		1.47* (.52)	
Other Party		.87* (.53)	
Refused/Didn't Vote		-.14 (.16)	
Political Affiliation (Strong Democrat)			
Weak Democrat			.44* (.21)
Independent, leaning Democrat			.34 (.22)
Independent			-.34 (.19)
Independent, leaning Republican			-1.05* (.26)
Weak Republican			-.96* (.23)
Strong Republican			-1.42* (.22)
Other			-1.10* (.38)
_cons	5.85* (.50)	6.38* (.44)	6.44* (.48)
Observations	909	1112	1,312
Adjusted R^2	.18	.07	.21
AIC/BIC	3747.7/3906.5	4927.4/5093.7	5742.9/5898.3
**<0.05 P-value.*			

Religious Affiliation and Attendance

Religious affiliation appears to be important in the USA, with protestants and 'other Christians' having lower country-level risk perception on average than non-religious individuals, with this effect being most pronounced amongst other Christians; -.65 lower than non-religious individuals on the 11-point risk perception scale. Meanwhile, there are no significant differences between religions in Finland and Japan.

Attendance of religious services is an important indicator in Japan and the United States, showing contrasting effects. For those who attend more than once a month in Japan, risk perception is significantly higher (.64) than those who never attend. In the US the opposite is true, with those who attend most having significantly lower (-.54) risk perception than those who never attend. In Finland, attendance of religious services does contribute to varying risk perception across the population.

Postmaterialism

Postmaterialism is an important indicator of risk perception in Japan, with significantly higher risk perception amongst postmaterialists (.58) than those who are materialists. Those who do not fit in either category do not vary significantly from materialists. For the US and Finland, the coefficients are insignificant, with very small coefficients in Finland.

Personal and Collective Efficacy

Personal efficacy is a significant indicator of country-level risk perception in Japan and the US, with the coefficients indicating a .22 and .28 point increase in risk perception, respectively, the more one disagrees with the statement its 'too difficult to do anything about the environment'. Collective efficacy is significant in Finland and the US, with the more an individual disagrees with the statement there's 'no point unless others do the same' with regards to environmental issues the higher their risk perception will be (.46 and .35, respectively).

Sociodemographic

Age, sex, and income are all insignificant indicators for country-level risk perception in Japan, with those who finished their lower secondary education having lower risk perception (-.47) than those who finished upper secondary education. This is true for the sociodemographic measures of sex, income and education in Finland too. Age is impactful in Finland and the USA, with both indicating the older one is the lower the risk perception of that individual is on average (-.02).

In the USA, there are also substantial differences between university educated individuals and those who finished upper secondary school, with lower tertiary (0.30) and upper- and post-tertiary (.63) educations leading to higher country-level risk perception. More broadly, this gap appears to be between those who are university educated and those who are not university educated in the USA. Sex and income are both insignificant in the US, as with Japan and Finland.

Political Affiliation

The results for political affiliation indicate differences between a few parties, with Centre Party (KESK) and Christian Democrats (KD) voters having significantly lower risk perception (-.79 and -.83, respectively) than the Social Democratic Party (SDP). The Green League (VIHR) have higher risk perception have .68 higher risk perception than the SDP.

The results for political affiliation in Japan indicate that it is generally not an important factor when determining country-level risk perception, with Social Democratic party voters, a minor party in Japan, indicating 1.44 higher risk perception than the Liberal Democrats.

Political affiliation is important in the case of the USA. Broadly, Democrats and those who lean democrat have significantly higher risk perception than republicans and those who lean Republican. This is a result in line with most of the analysis explored in the literature review. The results also indicate that independents are closer to Democrats than Republicans on this issue. Weak democrats have .44 higher risk perception than strong democrats.

Table 4.3 - Linear Regression results for World risk perception across 3 countries

	M2 - Finland	M2 - Japan	M2 - USA
Religion (No Religion)			
Evangelical Lutheran/ Protestant	-.21 (.15)		-.38* (.18)
Other Christian	-.91* (.46)	.23 (.31)	-.43 (.31)
Christian		.03 (.15)	
Buddhism	1.63 (1.97)	-.04 (.44)	.75 (.61)
Shinto			
Jewish			.15 (.47)
Catholic	.69 (.76)		-.24 (.19)
Attendance of Religious Service (Never)			
Once a month or less	.00 (.15)	-.18 (.18)	-.03 (.16)
More than once a month	-.65 (.35)	.30 (.32)	-.53* (.18)
Postmaterialism (Materialist)			
Postmaterialist	.17 (.20)	.68* (.24)	.14 (.21)
Neither	.01 (.17)	.47* (.10)	.15 (.18)
Personal Efficacy (Strongly Agree)	.14 (.09)	.35* (.07)	.26* (.06)
Collective Efficacy (Strongly Agree)	.30* (.07)	-.13* (.06)	.32* (.06)
Age	-.02* (.00)	.01 (.00)	-.02* (.00)
Sex (Male)	.03 (.13)	-.05 (.13)	.07 (.12)
Education (Upper Secondary/ High School(US))			
Primary			
Lower Secondary (*less than high (US)*)	.61* (.23)	-.42 (.26)	.19 (.21)
Post-Secondary, non-tertiary	.07 (.18)	.14 (.18)	-.12 (.19)
Short-cycle tertiary			
Lower tertiary (BA)	.32 (.19)	.11 (.17)	.22 (.17)
Upper tertiary (MA) *(& Post-tertiary in US*)	.47* (.20)	-.25 (.48)	.64* (.20)
Post-tertiary (PhD)	.67 (.46)	-.49 (.61)	
Income (Yearly, Quartiles)			
Lower Middle	-.13 (.28)	.28 (.20)	-.12 (.19)
Upper Middle	.06 (.18)	.23 (.21)	-.32 (.17)
Upper	-.30 (.20)	.30 (.22)	-.30 (.18)
Didn't Answer	.08 (.23)	.15 (.28)	-.42 (.30)
Political Affiliation (Social Democratic Party)			
True Finns (PS)	-.61* (.26)		
National Coalition Party (KOK)	-.16 (.24)		
Centre Party of Finland (KESK)	-.26 (.27)		
Green League (VIHR)	.66* (.25)		
Left Alliance (VAS)	.60 (.32)		
Swedish People's Party (SFP/RKP)	-.22 (.39)		
Christian Democrats (KD)	-.45 (.43)		
Other Party	.06 (.52)		
Refused/Didn't vote	-.24 (.21)		
Political Affiliation (Liberal Democratic Party)			
Constitutional Democratic Party		.16 (.22)	
Democratic Party For The People		-.02 (.40)	
KOMEITO		-.28 (.52)	
Japan Innovation Party		-.18 (.34)	
Japanese Communist Party		.29 (.28)	
Social Democratic Party		1.01 (.36)	
Other Party		.83 (.35)	
Refused/Didn't Vote		.05 (.16)	
Political Affiliation (Strong Democrat)			
Weak Democrat			.34 (.21)
Independent, leaning Democrat			.50* (.22)
Independent			-.71* (.19)
Independent, leaning Republican			-1.37* (.26)
Weak Republican			-1.21* (.23)
Strong Republican			-1.66* (.21)
Other			-.98* (.38)
_cons	6.96* (.46)	5.89* (.44)	6.68 (.45)
Observations	913	1134	1320
Adjusted R^2	.16	.07	.23
AIC/BIC	3650.2/3814	4988.3/5139.3	5760.9/ 5916.5
**<0.05 P-value.*			

Religious Affiliation and Attendance

In Finland, other Christians have .91 points lower world risk perception on the 11-point scale than those affiliated with no religion. The coefficient for protestants is also negative but insignificant. Japan's results are all insignificant, the same as country risk perception. In the US, protestants once again indicate lower risk perception (-.38), though this is a smaller effect than for country risk perception.

Postmaterialism

Postmaterialism is an indicator of world risk perception in Japan, with .68 points higher risk perception for postmaterialists than materialists. This is a larger effect than for country risk perception. Those who fit in neither category also have higher risk perception than materialists.

Postmaterialism is not a significant indicator of world risk perception in Finland or the US, once again mirroring country risk perception

Personal and Collective Efficacy

Higher perceived personal efficacy once again indicates higher risk perception in Japan and the US.

For collective efficacy, Finland and the US also show the same relationship, with those who disagree more with the statement 'no point unless others do the same' having higher world risk perception. In Japan, the opposite is true, where individuals who disagree most with the statement have lower risk perception.

Sociodemographic

Age indicates the same effects for world and country risk perception, with the older an individual is the lower their lower risk perception will be on average (-.02). Sex and income are insignificant in all 3 countries.

Education is important for world risk perception, with individuals with upper tertiary degrees having higher risk perception in both Finland (.47) and the US (.64). Education is insignificant in all case for Japan.

Political Affiliation

The results for political affiliation in Finland indicate that True Finns voters having significantly lower risk perception (-.61) than SDP voters. Green League (VIHR) voters again indicate higher risk perception (.66) than SDP voters.

In Japan, political affiliation is not a significant indicator of world risk perception.

In the USA, political affiliation is also an important indicator of world risk perception, showing larger effects than country-level risk. Independents and Republicans both signal consistently lower risk perception than Democrats.

Table 4.4 - Linear Regression with Interaction effects for Finland

Finland	**M3 – Country Risk**	**M3 – World Risk**
Political Affiliation (Social Democratic Party)		
True Finns (PS)	-1.00 (.56)	-.74 (.46)
National Coalition Party (KOK)	-.53 (.49)	-.43 (.44)
Centre Party of Finland (KESK)	-2.22* (.64)	-.54 (.69)
Green League (VIHR)	.20 (.44)	.44 (.44)
Left Alliance (VAS)	-.02 (.50)	.31 (.49)
Swedish People's Party (SFP/RKP)	-2.34 (1.35)	-1.49 (.878)
Christian Democrats (KD)	-2.01* (.75)	-1.63* (1.04)
Other Party	.27 (.67)	-.17 (.66)
Refused/ Didn't Vote	-1.15* (.43)	-.73 (.38)
Attendance of Religious Service (Never)		
Once a month or less	-.96* (.43)	-.43 (.39)
More than once a month	.16 (.66)	-.01 (.98)
Pol. Aff. # Attend (SDP/Never)		
Centre Party # Once a month or less	1.87* (.93)	
Swedish People's Party # Once a month or less	2.16* (1.03)	
Didn't Vote/ Refused # Once a month or less	1.09* (.49)	
True Finns # More than once a month		-5.40* (1.45)
_cons	7.40* (.53)	7.40* (.53)
Observations	909	913
Adjusted R^2	.18	.18
AIC/BIC	3645.8/3877	3645.8/3877
**<0.05 P-value.* *Includes all independent variables from M1 & M2* *Full models with interaction effects are included in the appendix (Table 9.1)*		

M3– Risk with Party Affiliation and Attendance interactions for Finland

Table 4.4 shows the results for country risk perception, indicating individuals affiliated with the Centre party (1.87), the Swedish peoples party (2.16) and those who didn't vote/refused to answer (1.09) have slightly higher risk perception if they attend religious services once a month or less, than those in the same party who don't attend at all.

True Finns voters who attend religious services more than once a month indicate far lower risk perception (-5.40) than those who attend less often or not at all, shown in figure 4.3 below. True Finns is a populist right-wing party, which could be indicative of a trend that this form of right-wing politics and stricter adherence to religious practice may be stronger indicator of lower climate change risk perception than their individual effects in Finland.

Figure 4.3 - Interaction effect for political affiliation and attendance of religious services on world risk in Finland

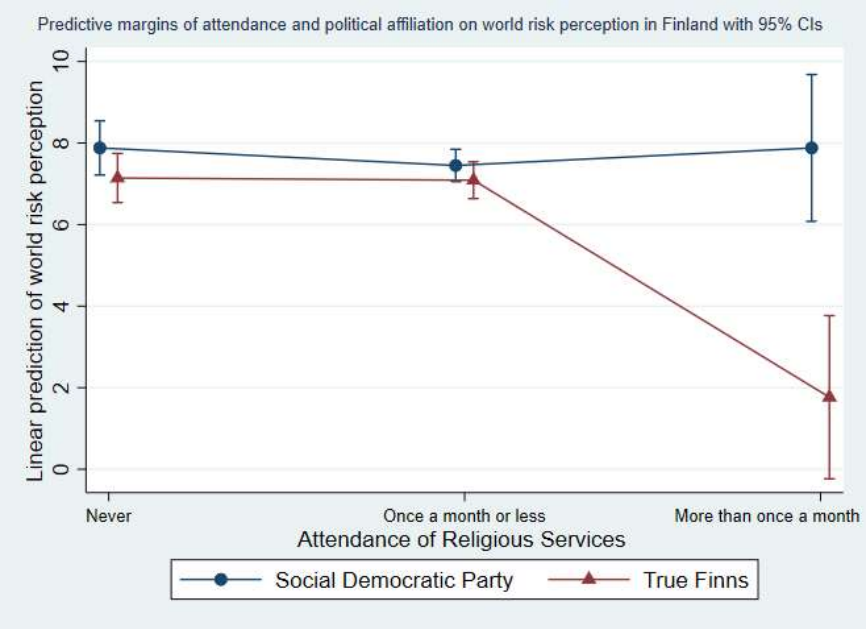


Table 4.5 - Linear Regression for with Interaction effects for Japan

Japan	**M4 – Country Risk**	**M4 – World Risk**
Political Affiliation (Liberal Democratic Party)		
Constitutional Democratic Party	-.97 (.27)	-.16 (.57)
Democratic Party For The People	.83 (.68)	1.08 (1.01)
KOMEITO	-.50 (.59)	-.55 (.79)
Japan Innovation Party	.54 (.40)	.68 (1.27)
Japanese Communist Party	.50 (.38)	1.61 (.89)
Social Democratic Party	1.64((.62)	2.09* (1.28)
Other	.50 (.62)	.70 (1.01)
Didn't Vote	-.00 (.19)	-.51 (.41)
Pol. Aff. # Religious Affilaition. (Liberal Democratic Party/ No Religion)		
Constitutional Dems#Other Asian Religion	-3.54* (1.58)	-4.03* (1.62)
Democratic Party # Buddhist	-2.06* (.99)	
_cons	6.35* (.43)	5.66*
Observations	1,112	1108
Adjusted R^2	.04	.06
AIC/BIC	4817.3/5067.9	4867.1/5087.6
**<0.05 P-value.* *Includes all independent variables from M1 & M2* *Full models with interaction effects are included in the appendix (Table 9.2)*		

M4 – Country and World risk perception with interaction effects for political affiliation and attendance in Japan

There are two notable interaction effects for religious affiliation and political affiliation in Japan, though these represent a small portion of Japanese society. Individuals affiliated with other Asian religions and the constitutional democrats have significantly lower risk perception (-3.54 CR & 4.03 WR) than non-religious liberal party members. This highlights that religious affiliation does impact climate change risk perception in Japan, though this is very limited. Buddhists in the democratic party also indicate lower risk perception than non-religious liberal party members.

Table 4.6 – Linear Regression with Interaction effects for the USA

USA	**M5 - Country Risk**	**M5 - World Risk**	**M6 - Country Risk**	**M6 - World Risk**	**M7 - Country Risk**	**M7 - World Risk**
Political Affiliation (Strong Democrat)						
Weak Democrat	-.35 (.34)	-.29 (.34)	-.07 (.35)	-.19 (.35)	1.66* (.57)	1.72* (.56)
Independent, leaning Democrat	-.13 (.35)	.04 (.34)	.21 (.36)	.32 (.35)	.64 (.57)	1.52* (.57)
Independent	-1.41* (.35)	-1.89* (.34)	-.61* (.32)	-1.35* (.31)	.08 (.52)	.12 (.51)
Independent, leaning Republican	-.67 (.63)	-1.69* (.62)	-1.62* (.49)	-2.17* (.49)	.74 (.77)	.56 (.76)
Weak Republican	-1.89* (.50)	-2.59* (.49)	-1.19* (.43)	-1.80* (.43)	-.13 (.66)	-.21 (.65)
Strong Republican	-2.19* (.50)	-2.17* (.50)	-1.77* (.41)	-2.28* (.41)	-.16 (.68)	.14 (.67
Other	-1.30* (.53)	-1.17* (.53)	-1.17 (.54)	-1.21* (.53)	1.00 (1.44)	1.22 (.143)
Attendance of Religious Services (Never)						
Less than once a month			-.16 (.33)	-.09 (.32)		
More than once a month			-1.36* (.34)	-1.86* (.34)		
Religion (No Religion)						
Protestant	-1.41* (.33)	-1.16* (.33)				
Catholic	-1.12* (.37)	-1.53* (.37)				
Jewish	-.45 (91)	.30 (.90)				
Other Christian	-1.87 (.76)	-.65 (.75)				
Buddhist	.86 (1.07)	.72 (1.05)				
Others	-.73 (1.09)	-.98 (1.07)				
Postmaterialism (Materialist)						
Postmaterialist					.74 (.50)	1.38* (.49)
Neither					1.15* (.44)	1.24* (.44)
Pol. Aff. # Rel. Aff. (Strong Dem # No Religion)						
Weak Dem. # Protestant	1.43* (.51)					
Weak Dem. # Catholic	1.11* (.55)	1.57* (.54)				
Ind. leaning Dem # Catholic		1.27* (.56)				
Independent # Protestant	1.82* (.46)	1.83* (.46)				
Independent # Catholic	.79* (.58)	2.42* (.51)				
Weak Rep. # Protestant		1.80* (.66)				
Weak Rep. # Catholic	1.40* (.67)	2.07* (.66)				
Pol. Aff. # Attend (Strong Dem # Never)						
Ind. leaning Dem. # More than once a month				1.35* (.55)		
Ind. # More than once a month				1.58* (.47)		
Ind. leaning Rep. # More than once a month			1.67* (.65)	2.35* (.64)		
Weak Rep. # More than once a month				2.15* (.59)		
Strong Rep. # more than once a month			1.05* (.53)	1.63* (.52)		
Pol. Aff. # Attend (Strong Dem # Materialist)						
Strong Republican # Postmaterialist						-2.49* (.80)
_cons	6.70* (.52)	7.34* (.51)	6.49* (.51)	7.45* (.50)	5.50* (.61)	5.83* (.60)
Observations	1312	1320	1312	1320	1312	1320
Adjusted R^2	.23	.25	.22	.25	.22	.23
AIC/BIC	5752.8/6089.5	5759.8/6096.8	5742.9/5970.8	5743.8/5971.9		5767.8/5996

**<0.05 P-value.*
Includes all independent variables from M1 & M2
Full models with interaction effects are included in the appendix (Table 9.3)

M5 –Risk perception with interaction effects for political affiliation and religious affiliation in the USA

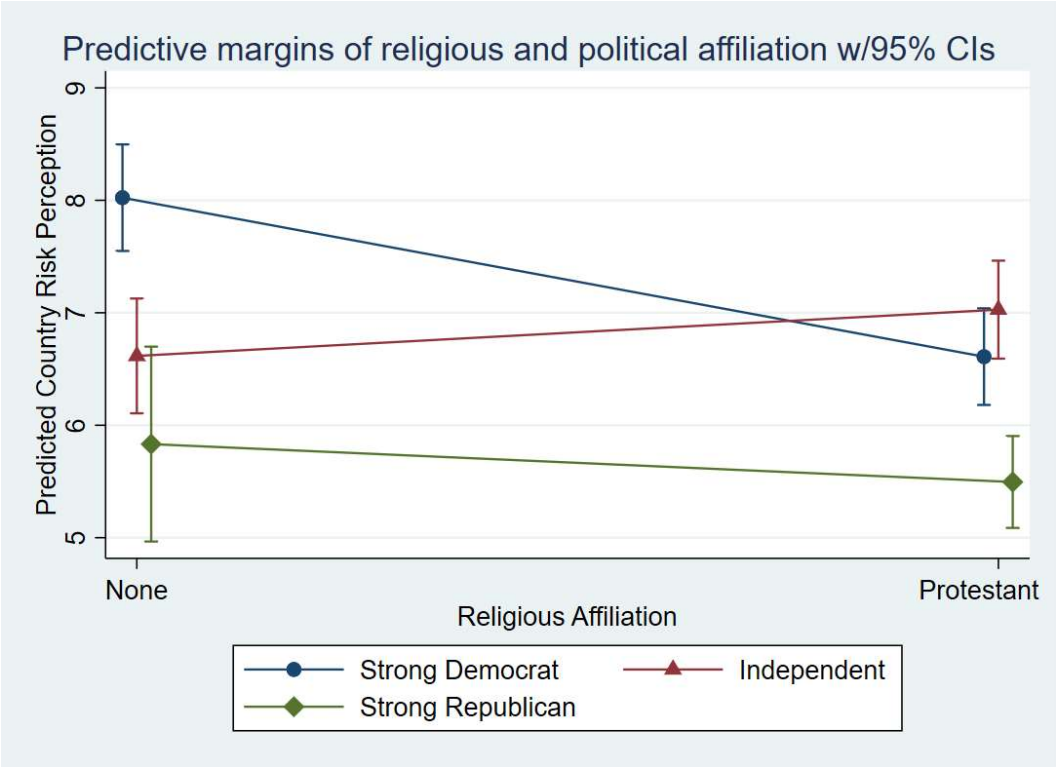
The results in M5 (Table 4.6) show several interaction effects between political and religious affiliation on country-level risk perception. It indicates that strong democrats who are non-religious have higher risk perception on average than strong democrats who are Protestant (-1.41) or Catholic (-1.16). Therefore, religion clearly moderates democrats positions on climate change, with significant differences between non-religious and Christian democrats. This replicates the results from Arbuckle (2017) discussed in the literature review.

Weak (-1.89 CR & -2.59 WR) and Strong Republicans (-2.19 CR & 2.17 WR) who are not religious have far lower risk perception than non-religious Democrats. Weak Republican protestants (1.80 WR) and Catholics (1.40 CR & 2.07 WR) have slightly higher risk perception than non-religious Republicans. However, the differences in the effects here are quite marginal, implying that the effect of religion on Republican country-level risk perception is quite weak, relative to democrats.

Independents have quite consistent risk perception regardless of whether they are Christian or non-religious, as observable in Figure 4.4. These findings show that religious affiliation is a considerable factor determining Strong Democrats climate change risk perception specifically, whereas this effect is negligible when it comes to independents and Strong Republicans, implying that political affiliation is more important for explaining their risk perception.

The results for world risk in the USA are similar to those for country risk. However, the differences between non-religious and protestant democrats are slightly smaller.

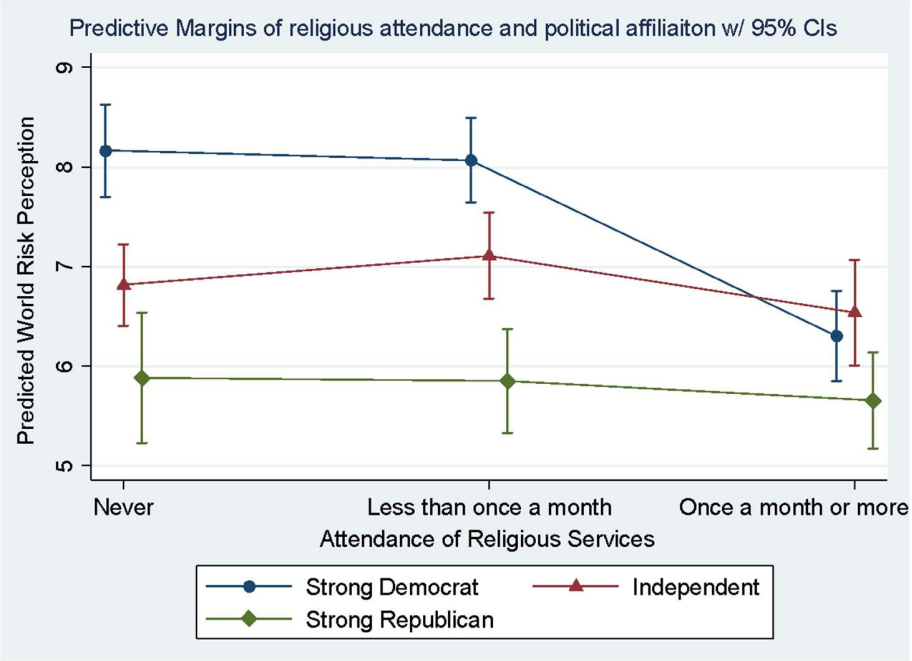
Figure 4.4 - Interaction effect for political affiliation and religious affiliation on country risk in the USA



M6 –Risk perception with interaction effects for political affiliation and religious attendance in the USA

The interaction effect for religious attendance and political affiliation indicates a similar effect on democrats as with religious affiliation. In this case, democrats who attend religious services once a month or more have around 1.86 points lower world risk perception than those who don't attend and those who attend less than once a month on the 11-point scale. This is true for country risk perception, with a slightly smaller coefficient (-1.36).

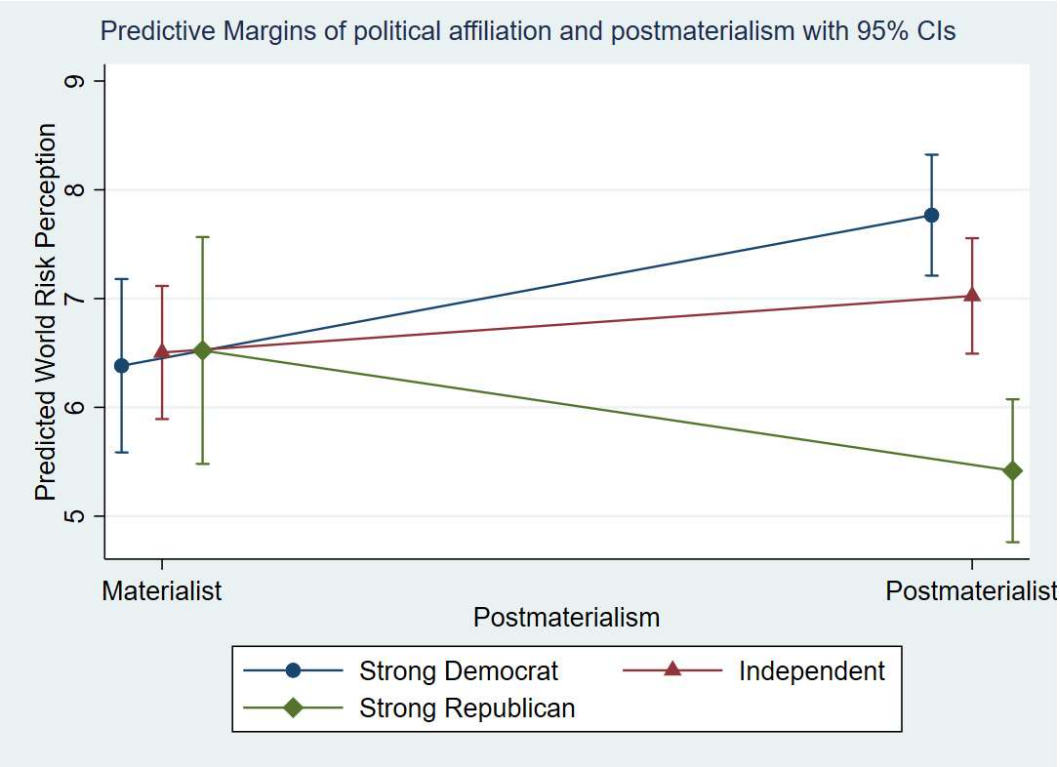
Figure 4.5 - Interaction effect for political affiliation and religious affiliation on world risk in the USA



M7 –Risk perception with interaction effects for political affiliation and postmaterialism in the USA

The interaction effect for political affiliation and postmaterialism indicates a distinction between postmaterialist Democrats and Republicans, with Republicans who prioritise freedom of speech and democratic representation indicating nearly 2 points lower risk perception than Democrats who prioritise the same issues.

Figure 4.6 - Interaction effect for political affiliation and postmaterialism on country risk in the USA



4.4 Conclusion

Across the 3 countries, there is evidence of the varying influence of the independent indicators included, with evidence that there is substantial variation between Finland, Japan and the USA in terms of contributors to both country-level and world-level risk perception.

Overall, the variables appear to be more effective in explaining risk perception in Finland and the USA compared to Japan, evidenced by larger effect sizes and significantly more variation explained with larger adjusted R^2. This highlights the importance of cross-country analysis in the case of risk perception analysis, in that it highlights similarities as well as outliers that indicate more research is necessary in these specific cases. Further, there is significant variation between countries in terms of the importance of different variables. In line with the literature, political affiliation appears to be particularly important in the United States, with prominent differences between Democrats and Republicans when it comes to country and world risk

perception. Meanwhile, in Finland and Japan this only applies to a limited number of parties, although the left-wing (including green) parties do tend to have higher risk perception than the average.

Political affiliation emerges as a particularly influential factor in the USA, aligning with existing literature. Differences between Democrats and Republicans are evident, with Democrats generally indicating higher world and country risk perception. However, the interaction effects highlighted three mechanisms through which democrats and republicans align more on the issue of climate change than the general trend. Religious affiliation, as emphasised by Arbuckle (2017), contributes to a substantial difference between democrats depending on faith; Protestant and Catholic democrats both indicate far lower risk perception than non-religious Democrats, with the former indicating similar climate change risk perception to the average republican, with little variation within this party based on religion. This mechanism also extends to attendance of religious services, with democrats who attend religious services most regularly, more than once a month, again showing similar levels of climate change risk perception to republicans and independents. The significant variation within the democratic party, not observed in most Finish and Japanese parties, could be indicative of the big tents represented by the American political parties, due to the two-party system. It could also be explained by the particularly, conservative, traditional nature of religion in the United States which is not observed to the same extent in Finland, while Japan's religious customs vary far more radically with a different majority religion of Buddhism/Shintoism.

The effect of political affiliation in the US is also moderated by postmaterialism. The evidence indicates that materialists in the US, those who prioritise 'maintaining order in the nation' and 'fighting rising prices' (Inglehart, 1971), do not vary across political affiliations in terms of their world risk perception. On the other hand, those who prioritise 'protecting freedom of speech' and 'giving the people more say in government', differ substantially across political groups. Postmaterialist Democrats and Independents may differ slightly, but postmaterialist Republicans indicate around 2.5 points lower world risk perception than postmaterialist Democrats. This result recontextualises the identified relationship between political affiliation and climate change risk perception in the USA, as it not only indicates a mechanism through

which policy and value priorities indicate varied stances on the issue of climate change but also highlights that amongst certain materialist priorities, risk perception seems quite consistent across political groups.

In Finland and Japan, the impact of political affiliation in general is more limited, with differences observed primarily among a few parties. Notably, the green party in Finland and Social Democrats in Japan having higher risk perception than the average, reflecting a trend of higher risk perception amongst left wing parties. The results for the interactions in Finland indicate an interesting alternative to the effects of religious attendance upon political affiliations in comparison to the US. The effect of increased attendance reducing risk perception, however, in this case True Finns voters, a right-wing populist party, are impacted by religious attendance. This may be explained by the generally more secular nature of religion in Finland, with a majority of Finns identifying as protestant yet religiosity in the public sphere is relatively limited, particularly in politics as explored in the country profile. Therefore, the conservative effects of religion and politics in Finland may be restricted to a more particular minority of individuals who adopt both conservative politics and traditional perspectives of religion.

Differences in Finland appear to follow a theme that can be contrasted with the US, with no significant differences between religions, postmaterialism, perceived efficacy or education. Finland's more egalitarian society, pluralist and representative democracy, with generally higher and more equal socio-economic outcomes, lower levels of diversity, less polarised political culture, and lower levels of religiosity (when considering factors including attitudes, attendance, belief in God, and not just affiliation) may coincide with more homogeneity when it comes to attitudes such as perceived efficacy and indeed climate change risk perception. Meanwhile, the observed differences in the US appear to indicate a relatively divided culture in terms of educational outcomes, politics and religion. This characterisation has been noted in the countries' responses to COVID-19, where the issue in the US remains polarised along political lines (Kerr et al. 2021) and has arguably reduced confidence in US political institutions (Robinson, 2022), while in Finland the issue did produce tensions yet broad political, morally charged consensus ensured an effective and pluralistic response (Lehtonen & Ylä-Anttila, 2024).

The potential similarities between COVID-19 and climate change are discussed following the multilevel analyses.

The significantly lesser explanatory power of the models for Japan, when compared to Finland and the USA indicate an important issue for this research that should be considered. Japan seems to sit somewhere within the middle, with significant differences arising from attitudinal measures in particular, i.e. postmaterialism and perceived efficacy, but less so in terms of politics, religious affiliation and sociodemographic measures. The positive effect for religious attendance in Japan offers an interesting contrast to Finland and the US, where in Finland, attendance indicates negative effects on right-wing affiliated voters, and in the US it indicates a general negative effect and substantially moderates democratic voters risk perception. This finding represents an important distinction between countries with a different religious majority and culture, and guides the upcoming theoretical chapter and 2nd empirical analysis.

Nonetheless, the significant indicators included in this research only accounted for a very small amount of the variation in Japanese individual's risk perception. The variables for the research were chosen based primarily on theoretical work considered in the literature review, which was primarily produced in Western/European countries. As such, it could be argued that this research has a Eurocentric foundation that may have limited the capacity of the research to capture contributors to risk perception in other cultural contexts. While this is somewhat useful as it identifies the weaknesses of broad generalisations across countries regarding determinants of risk perception, it may also emphasise the importance of increasing access to literature across cultural/linguistic lines. Nonetheless, the 3 countries analysed here are not enough to establish such a limitation, but this will be important moving forward to the analysis with 28 countries.

5. Understanding the influence of individual and aggregate level measures of religiosity on climate change risk perception across 28 countries.

5.1 Introduction

This section presents analysis purposed with answering research questions relating to the importance of religion on climate change risk perception and enables empirical testing of theoretical expectations outlined in a prior chapter. Following both univariate and bivariate analysis, multilevel models are introduced with discussion of the initial random intercept models. These models indicate the importance of the individual-level predictors of climate change risk perception included in the prior analysis across the 28 countries, providing evidence for the strength of the political affiliation and attendance of religious services as general contributors to climate change risk perception, with the uneven influence of the latter identified in the 3-country analysis. Religious affiliation is also considered in detail, with asymmetric results across countries and within regions with similar characteristics. The random slopes models aim to provide further clarity regarding how the effects of the indicators for religion vary across countries, with the aim of observing how these correspond to the theoretical expectations.

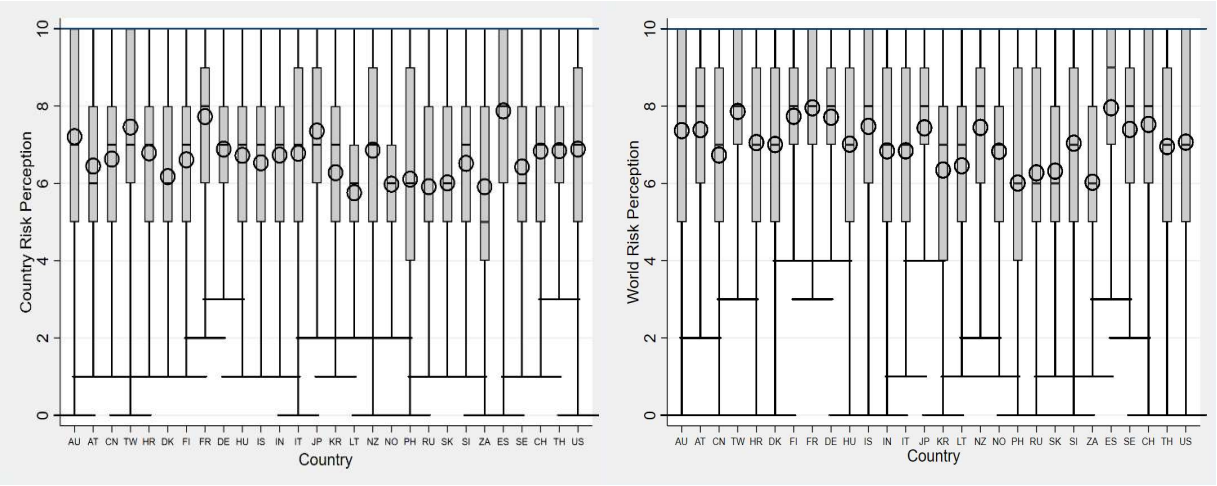
Following this, the inclusion of majority religion measures and two religious fundamentalism (government restriction of religion and social hostility to minority religions) on the country-level provide further scope to answer theoretically relevant questions pertaining to how religious institutions influence and shape climate change risk perception Further, cross-level analysis of how the impact of individual religious affiliation varies according to GPD per capita provide an opportunity to observe the asymmetric effects of individual religious beliefs across countries of varying levels of wealth upon climate change risk perception. Finally, climate related measures are included for the purposes of sensitivity analysis.

5.2 Multivariate Linear Regression Analysis of climate change risk perception across 28 countries with individual-level indicators

5.1.1 Univariate analysis of dependent and independent variables

Table 5.1 shows the univariate statistics of the individual-level variables for all countries in the sample[17]. A table for the aggregate level variables is included below, though these become relevant in section 5.2. Figure 5.1 shows a boxplot with the weighted means (indicated by circles), median, lower and upper quartiles for country and world risk perception in each country. The boxplots indicate that there is far more variation within countries than between them for both country and world risk perception.

Figure 5.1 Weighted boxplots for country and world risk perception by country



[17] The table for univariate statistics by country individually can be found in the appendix (Table 9.5).

Table 5.1 Univariate Statistics of individual-level independent variables for 28 countries

Individual Level Variables	No. of Countries	Mean	Median	Range	Observations (%Missing)
Country Risk Perception	28	6.69	7	0 / 10	40,741 (13%)
World Risk Perception	28	7.11	7	0 / 10	40,842 (12%)
Political Ideology	27			0 / 5	44,100 (0%)
Left/ Far Left		.03			
Centre-Left		.07			
Centre		.12			
Centre-right		.18			
Right/ Far Right		.01			
Refused/ Didn't Vote		.58			
Postmaterialism	28			0 / 2	38,987 (13%)
Postmaterial		.08			
Material		.29			
Neither		.63			
Personal Efficacy	28	1.83	2	0 / 4	42,999 (4%)
Collective Efficacy	28	1.72	1	0 / 4	43,061 (4%)
Religion	28			0 / 10	42,990 (<1%)
No Religion		.42			
Catholic		.08			
Protestant		.06			
Orthodox		.02			
Other Christian		.02			
Jewish		.00			
Islamic		.06			
Buddhist		.04			
Hindu		.28			
Other Asian Religions		.01			
Other		.00			
Religious Attendance	28	0.72	1	0 / 2	42,567 (1%)
Age	28	46.04	45		44,100 (0%)
Sex	28	0.52	1	0 / 1	44,027 (<1%)
Income Quartile	28			0 / 4	44,100 (0%)
Lowest (0-25%)		.24			
Lower Middle (26-50%)		.27			
Upper Middle (51-75%)		.24			
Upper (76-100%)		.13			
No Answer		.12			
Education	28			0 / 7	43,267 (1%)
No Education		.18			
Primary		.21			
Lower Secondary		.18			
Upper Secondary		.18			
Post-Secondary/ Short-cycle tertiary		.09			
Lower tertiary (BA)		.13			
Upper tertiary (MA)/		.04			
Post-tertiary (PhD)		.01			

Source: Authors calculations using ISSP Environment IV data (2023)
Full table with individual countries in Appendix (Table 9.5)

Table 5.2 shows the univariate statistics for the aggregate level variables. The majority of countries in the datasets have Christian majorities, with roughly one quarter of being protestant majorities. This coincides with the average for individual Christians across countries being over 50%. The mean for GDP per capita indicates that the 28 countries in the dataset are relatively wealthy compared to the global average (~$12,363 in 2021 (World Bank, 2024)). The means for both religious fundamentalism measures indicate generally low levels of fundamentalism across the countries.

Table 5.2 Univariate Statistics of aggregate-level independent variables for 28 countries

Aggregate Level Variables	**No. of Countries**	**Mean / *Proportion***	**Median**	**Range**	**Observations (%Missing)**
Majority religion	28		0	0 / 1	44,100 (0%)
Christian		*76.9*			
Eastern		*23.1*			
Majority religion (alternative)	28		1	0 / 2	44,100 (0%)
Protestant		*25.46*			
Other Christian		*51.46*			
Eastern		*23.08*			
Proportion of Christians	28	55.8	60.8	0 / 100	44,100 (0%)
GDP per capita (log)	28	39550.4 (4.6)	10.47	7.7 / 11.4	44,100 (0%)
Government restrictions based on religion	28	1.04	1	0 / 3	44,100 (0%)
Social hostility toward minority religion	28	1.18	1	0 / 3	44,100 (0%)

5.2.2 Bivariate Analysis

Table 5.3 includes summary statistics for the bivariate analysis of the 28 countries, with each country's individual results included in the appendix (Table 9.6 & 9.7). The range columns show the lowest and highest of each statistic across the 28 countries. There are substantial differences in variation and explanatory power for political affiliation and religious affiliation's relationship with climate change risk perception across the countries. The aggregate level statistics show the bivariate relationship with all countries together. These relationships are shown clearly in figure 5.4 in the later section where aggregate level variables are brought into the models.

Table 5.3 shows that political affiliation has on average relatively weak explanatory power with a mean of R^2 of 3% for both risk perception measures. The largest R2 is 14%, indicating its importance in some countries.

The results for religious affiliation indicate that it is generally a small contributor to climate change risk perception with an average R^2 of 2% for both risk perception measures. Attendance of religious services has a generally negative relationship with climate change risk perception, and a low mean R^2 of 1%.

Postmaterialism is generally not a large contributor to risk perception across countries, with an average R^2 of 1% for both risk perception measures.

The personal and collective efficacy measures show generally positive effects on both country and world risk perception, with an average R^2 of 2%.

Age is a generally weak indicator of climate change risk perception, though for some countries it is a core indicator. The effect of age is substantially higher on average for world risk perception than country risk perception, with a mean R^2 of 2%. Sex is generally not an important contributor with a very small average R^2 of 0.3%. Higher levels of education are generally an indicator of higher risk perception with an average R^2 of 2%. Income is generally not an important indicator of climate change risk perception. Age measured as a categorical variable (20-29, 30-39, etc.) did not indicate different results.

Altogether the individual-level variables offer a low R^2 with all countries taken together, with substantial variation in explanatory power across countries.

Table 5.3 Bivariate statistics for independent variables and climate change risk perception for 28 countries

	Overall f-statistic	Range	Spearman mean	Pearson mean	Range	R^2 mean	Range
Country Risk Perception							
Political Ideology	47.4	.48 / 937.5				.03	.00 / .14
Postmaterialism	4.2	.01 / 16.48				.01	.00 / .03
Religious Affiliation	209.8	.41 / 1141				.02	.00 / .08
Personal Efficacy			.11		-.17 / .26	.02	.00 / .05
Collective Efficacy			.11		-.07 / .29	.02	.00 / .07
Religious Attendance			-.06		-.30 / .10	.01	.00 / .04
Age			-.01		-.03 / .01	.01	.00 / .10
Sex			-.05		-.04 / .19	.004	.00 / .03
Income	2.47	.07 / 15.08				.01	.00 / .05
Education			.08		-.04 /.23	.02	.00 / .06
Aggregate Level							
GDP (log)			.13	.04		.04	
Major Religion			.34	.05		.05	
Major Religion (Protestant)	5571.2			.03		.03	
Proportion of Christians			-.01	.19		.19	
Government Restriction			-.11	.02		.02	
Social Hostility			-.09	.01		.01	
World Risk Perception							
Political Ideology	45.6	.64 / 782.9				.03	.00 / .14
Postmaterialism	5.0	.02 / 19.52				.01	.00 / .04
Religious Affiliation	296.5	.93 / 1631.5				.02	.00 / .07
Personal Efficacy			.13		-.18 / .25	.03	.00 / .07
Collective Efficacy			.13		-.15 / .29	.03	.00 / .08
Attendance			-.06		-.18 / .07	.01	.00 / .04
Age			-.05		-.28 / .06	.02	.00 / .11
Sex			.03		-.05 / .11	.003	.00 / .02
Income	3.10	.03 / 13.16				.01	.00 / .05
Education			.10		-.08 / .33	.02	.00 / .09
Aggregate Level**							
GDP (log)			-.06	.12		.12	
Major Religion			.29	.00		.00	
Major Religion (Protestant)	79.46			.03		.03	
Proportion of Christians			-.00	.05		.05	
Government Restriction			-.12	.01		.01	
Social Hostility			-.12	.04		.04	

**<0.05 P-value*

*** Aggregate level bivariate tests utilise the variance component model (M8) observable below and present the level-2 R^2. Plots are shown in figure 5.4 below.*

5.3 Multilevel models

This section of the analysis includes multilevel analysis of the 28 countries data. This progresses in stages beginning with random intercept models, which include the individual level variables included in the linear regression with the clustering by country enabling the analysis of between and within country variance. Following this, random slope models are utilised, enabling for a greater understanding of the variation in coefficients across countries. This will provide a clearer understanding of the differences between countries for specific explanatory variables relevant to the research questions set out in the methodology section relating to religion and allow for testing of the theoretical expectations identified in section 1.3. Next are the random intercept models with aggregate level variables which are mainly aimed at further understanding the influence of religion on climate change risk perception. Finally, cross level interactions are tested for GDP and religious affiliation. The results are then discussed with reference to the theory section and relevant literature.

5.3.1 Random intercept models

The first models in Table 5.4 are the variance component models which include the outcome variables of country-level and world-level risk perception and the cluster variable which is the 28 countries.

Table 5.4 Variance component model for country and world risk perception

	Country Risk (M8)	**World Risk (M8)**
Constant	6.65* (.10)	7.08* (.11)
Random-effects parameters		
Constant Variation	.28 (.07)	.30 (.06)
Residual Variation	5.02 (.21)	5.24 (.23)
LR test	23612.3*	22976.3*
Intraclass Correlation Coefficient (ICC)	.05	.05
AIC	152800.6	154745.7
BIC	152826.4	154771.5
Observations (Countries)	40,741 (28)	40,842 (28)
**<0.05 P-value.*		

The constant for the variance component model is simply the average across countries due to the lack of independent variables, indicating similar results to the univariate means for risk perception across countries displayed above (Table 5.1). The constant variation shows the

variation of the random intercepts across groups, in this case the variation in average country risk and world risk across countries, while the residual variation is the variation at the individual level. The ICC is obtained using these two forms of variation. The majority (95%) of the variance for risk perception is explained by individual-level differences, while 5% is explained by differences between countries. This null model indicates that multilevel modelling is an appropriate form of analysis for this data, with the LR test statistics greatly exceeding the critical value of 3.84 (Snijders & Bosker, 2012: p52). The deviance is a measure of model fit, which should decline with the inclusion of explanatory variables.

Table 5.5 Mixed Effects Random intercept model for country risk perception with individual-level variables

	Country Risk (M9)	World Risk (M9)
Political Affiliation (Centre/Centre-left)		
Centre Left	.22 (.13)	.16 (.13)
Left/Far Left	.42* (.11)	.42* (.12)
Centre Right	-.26 (.15)	-.34* (.15)
Right/ Far Right	-.39* (.19)	-.43* (.21)
Refused/Didn't vote	-.02 (.10)	-.04 (.10)
Religion (No Religion)		
Catholic	-.05 (.07)	-.02 (.06)
Protestant	-.12 (.10)	-.13 (.11)
Orthodox	-.17 (.15)	-.25 (.18)
Other Christian (Varies by country)	-.15 (.11)	-.20 (.12)
Jewish	.14 (.25)	.10 (.34)
Islamic	-.16 (.19)	-.22 (.15)
Buddhism	.17 (.15)	.18 (.13)
Hindu	.05 (.23)	-.15 (.16)
Other Asian Religions (Varies by country)	.00 (.10)	-.04 (.06)
Other (Varies by country)	.18 (.16)	.31 (.17)
Attendance of Religious Service (Never)		
Once a month or less	-.13* (.04)	-.13* (.04)
More than once a month	-.27* (.09)	-.31* (.09)
Postmaterialism (Materialist)		
Postmaterialist	.08 (.07)	.15* (.07)
Neither	-.06 (.04)	-.01 (.05)
Personal Efficacy	.12* (.03)	.13* (.03)
Collective Efficacy	.12* (.02)	.14* (.03)
Age	-.01* (.00)	-.01* (.00)
Sex (Male)	.14* (.04)	.11* (.03)
Education (Upper Secondary)		
No Education	-.03 (.17)	.06 (.13)
Primary	.04 (.07)	.05 (.09)
Lower Secondary	-.01 (.05)	.00 (.05)
Post-secondary/Short-cycle tertiary	.03 (.05)	.05 (.06)
Lower tertiary (BA)	.17* (.04)	.18* (.05)
Upper tertiary (MA)	.28* (.07)	.37* (.09)
Post-tertiary (PhD)	.46* (.12)	.67* (.09)
Income (25% Quartile)		
Lower middle	-.02 (.03)	.07 (.04)
Upper middle	.03 (.05)	.12* (.05)
Upper Quartile	-.00 (.07)	.11 (.07)
No answer/ refused	.01 (.06)	.03 (.06)
Constant	6.00* (.19)	6.41* (.17)
Var (Constant)	.25 (.07)	.24 (.05)
Var (Residual)	4.80 (.24)	2.49 (.06)
Observations (Countries)	34,305 (28)	34,353 (28)
ICC	.05	.05
LR Test vs VCM	24866.97*	25603.3*
Snijders/Bosker R-squared Level 1	.04	.05
Snijders/Bosker R-squared Level 2	.11	.25
AIC	128223.8	129331.3
BIC	128536.2	129643.8
**<0.05 P-value.*		

M9 (Table 5.5) shows the regression slope coefficients for individual-level explanatory variables on country and world risk perception. The results are similar for both risk perception measures and differences will be pointed out for each explanatory variable. Models for the multivariate linear regression analysis for each of the 28 countries are included in the appendix (Tables 9.8 & 9.9).

The coefficients for political affiliation in M9 indicate positive effects for left/far-left politics and negative effects for right/far right for country risk perception. Meanwhile, centre-left and centre-right indicate little difference with centre parties. The effects are similar for world risk perception, with slightly larger negative effects for centre right and far right.

The results for religion on country and world risk perception are also not statistically significant. Catholicism, Protestantism, Orthodox, Other Christian and Islam have negative coefficients. Meanwhile, Judaism and Buddhism indicates positive effects. Hinduism is the only one that varies across risk perception measures, with a small positive coefficient for country risk and a slightly larger negative effect for world risk. These results will be discussed alongside aggregate level models including religious majorities and fundamentalism below.

Attendance of religious services shows that those who attend most regularly have significantly lower country risk perception than those who never attend, with -.27 lower risk perception. This effect is slightly larger (.31) for world risk perception. Those who attend less often than once a month also have lower country and world risk perception though this effect is weaker (.13).

The result for postmaterialism show there is a substantive difference between materialists and postmaterialists when it comes to world risk perception, with .15 higher risk perception for postmaterialists. Postmaterialism is quite inconsistent across countries.

Personal and Collective efficacy indicate small positive coefficients for both risk perception measures meaning higher perceived efficacy indicates higher risk perception.

Age has a negative coefficient, indicating that with age individuals' country risk perception declines. For example, the effect of being 20 years older than the youngest in the population is -

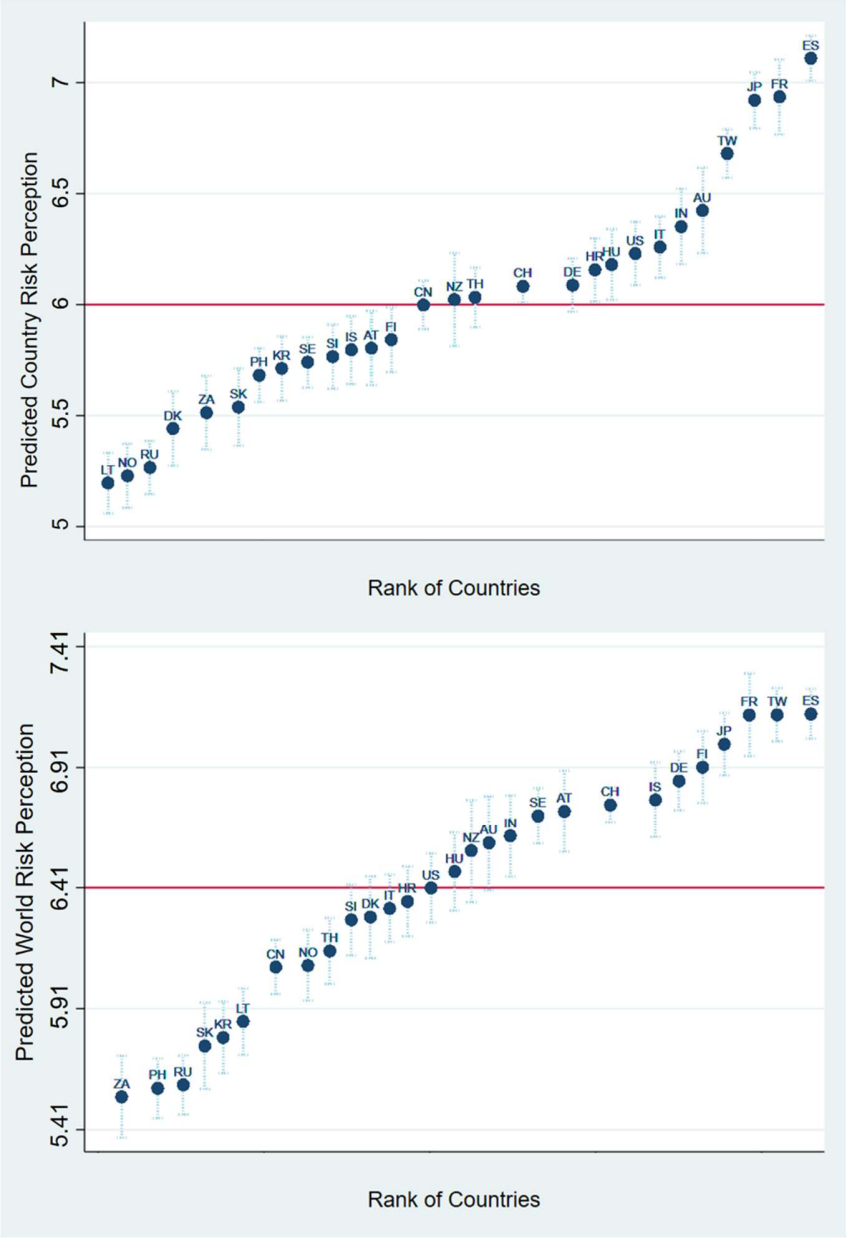
.20. Meanwhile, gender's positive coefficient indicates that women generally have higher risk perception than men, with the effect being slightly smaller for world risk perception. Education indicates a clear trend, with individuals with more than upper secondary eduation having higher risk perception, with the effects increasingly linearly. This increases linearly with positive coefficients for BSc (.17), MSc (.28) and PhD (.46) showing an upward trend with higher education for country risk, and a stronger trend of .18, .37, and .67 in the same categories for world risk perception. This indicates that across the 28 countries education is an important contributor to differences in risk perception. Income doesn't seem to be an important factor for country risk perception with small, insignificant coefficients for all income quartiles. However, individuals in upper middle quartiles have higher world risk perception.

The variation of the constant indicates a .25 and .24 difference across countries for country and world risk perception repsectively, though most variation is explained by within-group variation. The AIC and BIC for M9 are lower than the variance component model (Table 5.4) meaning the inclusion of the explanatory variables provides better model fit than without them, and this is also true for the residual variation which is substantially reduced compared to the variance component model. The level one R^2 (L1 R^2) are 4% and 5%, respectively, which is quite low. The level two R^2 (L2 R^2) shows 25% of the variation in world risk perception at the country level being explained by the model, with only individual level variables. This is much lower for country risk at 11%. The changes in the L2 R^2 with the inclusion of the aggregate level variables should be considered with these as baseline figures in order to understand the relative influence of aggregate level variables when they are included later in the analysis. The results for both country and world risk perception are broadly similar.

The predicted values for country-level risk perception in the level-1 random intercept are included in Figure 5.2 below. In descending order, Finland, Austria, Iceland, Slovenia, Sweden, South Korea, the Philippines, Slovakia, South Africa, Denmark, Russia, Norway and Lithuania score under the mean. This means that the country level risk perception in these countries is lower than the average of the 28 countries. In ascending order, Switzerland, Croatia, Hungary, the US, Italy, India, Australia, Taiwan, Japan, France and Spain sit above the mean meaning their country level risk perception is higher than the average across the 28 countries. Spain, France

and Japan indicate substantially higher than the mean, with Spain indicating 1-point higher risk perception than the mean. The opposite is true for Lithuania, Norway and Russia, all sitting at least .06 below the country average. Therefore, the differences between countries are quite substantial in the context of coefficients in the mixed models, with a range of nearly 2 points in country risk perception, though a smaller number of countries are on the extremes. For world-level risk perception shows that 11 countries can reliably be said to sit above the mean; India, Sweden, Austria, Switzerland, Iceland, Germany, Finland, Japan, France, Taiwan, and Spain have higher world level risk perception. Meanwhile, Thailand, Norway, China, Lithuania, Korea, Slovakia, Russia, the Philippines, and South Africa are below the mean. The range appears to be slightly smaller between the highest and lowest risk perception for world risk perception compared to country risk perception. Therefore, there appears to be a more consistent gap between countries in terms of world risk perception, with fewer countries at the extremes, providing a more linear trend than for country risk perception.

Figure 5.2 Rank of countries by random intercept for climate change risk perception with individual-level variables (M9)



5.3.2 – Random Slopes models

Table 5.6 Random slopes model for country risk perception for Religious Affiliation

	Country Risk (M10)	World Risk (M10)
Religion (No Religion/Country Specific)		
Catholic	-.16 (.17)	-.22 (.19)
Protestant	-.23 (.17)	-.33 (.20)
Orthodox	-.47 (.27)	-.67* (.28)
Other Christian (Varies by country)	-37 (.22)	-.57* (.25)
Jewish	-.11 (.28)	-.27 (.37)
Islamic	.28 (.25)	-.44 (.25)
Buddhism	-.13 (.30)	-.17 (.33)
Hindu	-.87 (.54)	-.27 (.23)
Constant	4.22 (1.52)	2.51 (1.50)
Var(Catholic)	.06	.06
Var(Protestant)	.16	.18
Var(Orthodox)	.30	.15
Var(Other Christian)	.06	.04
Var(Jewish)	.00	.00
Var(Islamic)	.32	.38
Var(Buddhism)	.41	.53
Var(Hindu)	1.86	.00
Var (Constant)	.23	.17
Var (Residual)	4.77	4.92
Observations (Countries)	34,305 (28)	34,305 (.28)
ICC	.05	.03
AIC	128175.3	129256.7
BIC	128605.9	129594.5
**<0.05 P-value.* *Controls Include all individual-level variables from M9 (Table 5.5)*		

The random slopes models for religious affiliation (Table 5.6) indicate that there are some small cross-national differences. The slopes for Catholics and Protestants show a small negative effect on country-risk perception though this is within the margin of error. For orthodox Christians the negative trend is fairly pronounced (-.47) with a fair amount of variation (.30), though this is also not statistically significant. Muslims show a substantial amount of variation with a slight negative trend. However, there are several cases where Muslims indicate higher risk perception. Hindus show the largest negative effect on country-risk perception however the variation (1.82) means that this is not consistent across countries. The deviance is higher with the inclusion of random slopes meaning their inclusion may not help to explain the differences in country-level risk perception in comparison to the random intercept model. This may be due to the low sample size for several of the religions included.

The results for Catholics shows a positive effect on world risk perception, in contrast to country risk perception. Protestants show a slightly weaker negative effect for world risk (-.09), while

orthodox Christians have significantly lower risk perception (-.67) across countries with some variation (.19). Other Christians show a significant negative effect (-.57) with low variation. Muslims again show a slight negative trend (-.44) with large variation across countries (.38). This is true for Buddhists too with a -.17 effect with substantial variation (.53) implying Buddhists vary in their risk perception more than other religious groups. The deviation is also higher for the random slopes implying worse model fit than the random intercept model.

Altogether the random slopes for religious affiliation don't provide much clarity regarding variation across countries, with further analysis of aggregate-level religious factors below aiming to provide detailed assessment of the impact of religion on climate change risk perception.

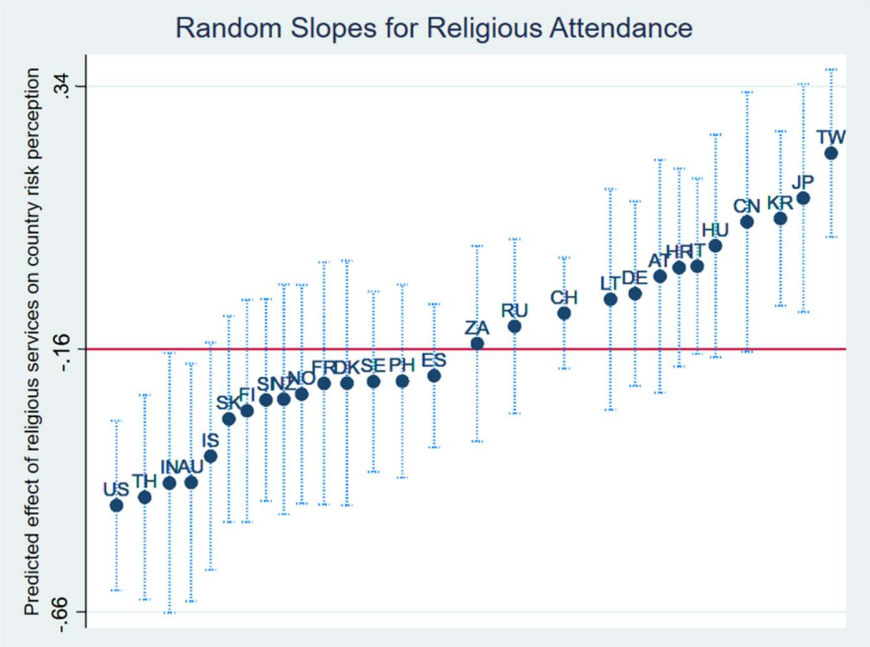
Table 5.7 Random slopes model for country risk perception for attendance of religious services

	Country Risk (M11)	**World Risk (M11)**
Attendance (Never)	-.16* (.04)	-.15* (.04)
Constant	5.08 (1.64)	2.67 (1.91)
Var(Attendance)	.04 (.01)	.03 (.01)
Var(Constant)	.35 (.10)	.31 (.01)
Var (Residual)	4.78 (.24)	4.94 (.27)
Observations (Countries)	34,305 (28)	34,353 (28)
ICC	.04	.04
AIC	128180.9	129299.7
BIC	128552.4	129662.5
**<0.05 P-value.* *Controls Include all individual-level variables from M9 (Table 5.5)*		

The random slope models for attendance of religious services (Table 5.7) indicate a similarly negative effect for religious attendance across countries (-.16 and -.15). This means those who attend most often have on average .32 and .30 lower country and world risk perception, respectively, across the 28 countries. Figure 5.3 shows the variation in country slopes for country risk perception, with 4 Buddhist majority countries (Taiwan, Japan, Korea and China) indicating higher risk perception amongst religious attendees than other countries, which may manifest as either as smaller negative effect or a small positive effect for attendance in these countries, with the caveat that Thailand second from bottom. Meanwhile, the US, India and Australia are expected to have greater negative effects for attendance of religious services relative to other countries. The results for world risk perception indicate slightly less variation

across countries, with the trend of more positive effects for attendance amongst Buddhist countries in this case only extending to Taiwan and Korea.

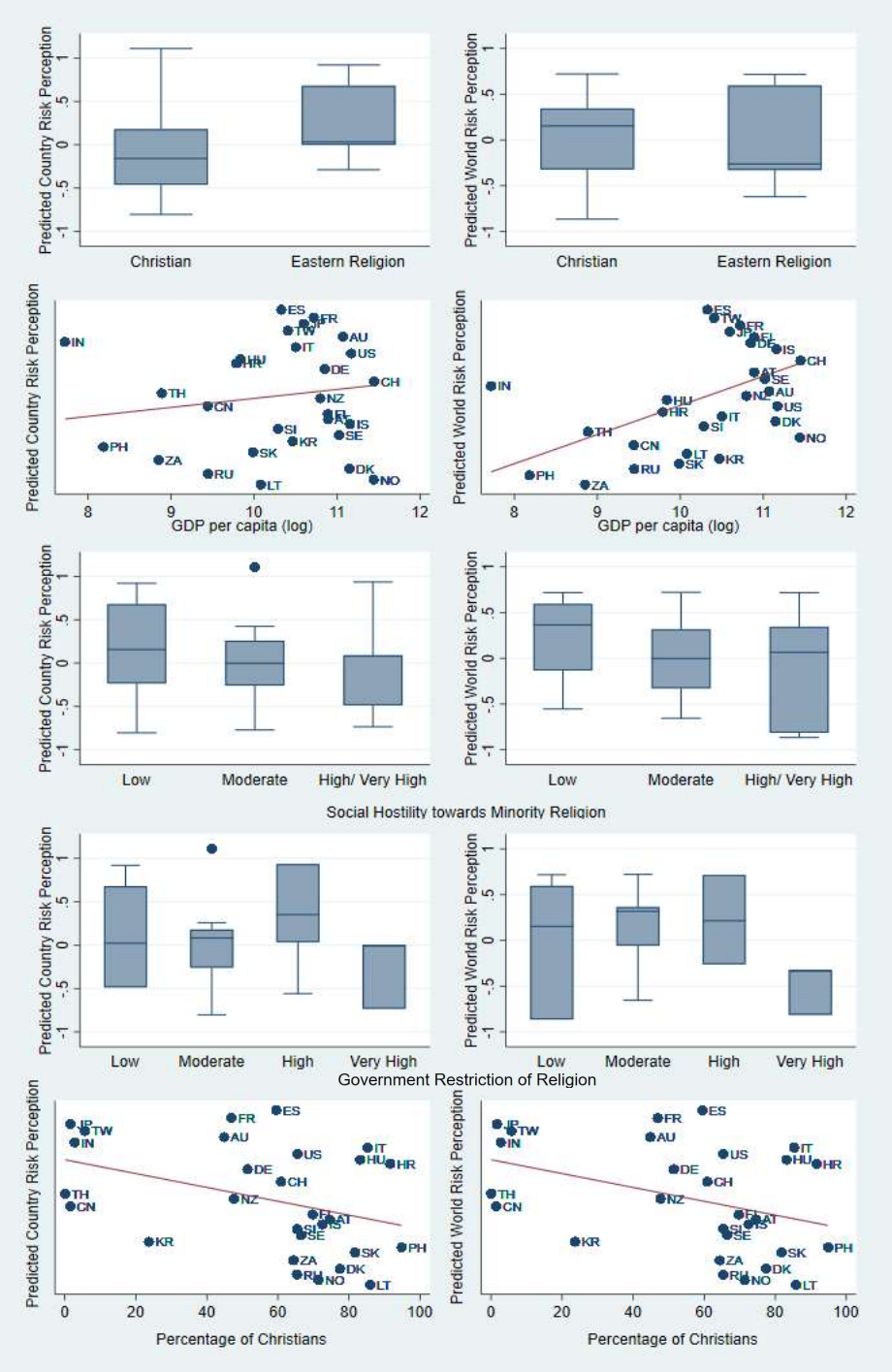
Figure 5.3 Predicted slopes for attendance of religious services on country risk perception across countries (M11)



5.3.3 2-level random intercept models with country-level religion predictors

This section includes two-level models with both individual and aggregate level predictors. This enables further inquiry into the between-country variation in climate change risk perception.

Figure 5.4 Bivariate relationship between aggregate level variables and estimated risk perception random intercept from M9



The first two plots in figure 5.4 show the relationship between the level 1 random intercepts (M9) and major religion. The plots show some variation across major religions in risk perception. The average country risk perception appears higher for Eastern religions compared to Christian Religions with an R^2 of 8%. Meanwhile this relationship is very weak for world risk perception, with an R^2 of <0.1%

Log of GDP and country risk perception indicates a weak positive relationship with an R^2 of 1%, while the trend for world risk perception does show a stronger positive relationship with higher GDP correlated with higher world risk perception with a high R^2 of 30%.

Government restrictions on religion and risk perception are not linearly related, with substantial variation within categories of government restriction, with R^2 of 4% and 6% for country and world risk perception respectively.

There is no indication of a linear relationship between social hostility towards minority religions and climate change risk perception, with R^2 of 2% and 4% respectively. It should be noted that the outlier visible (Figure 5.4, plots 3 and 4) for country risk perception and government restrictions as well as social hostility is Spain, meaning that it is substantially different from the rest of the category it is included in for both measures.

Percentage of Christians is a very strong predictor of country risk perception, with a clear negative trend and an R^2 of 18% and this is true for world risk perception though with a substantially lower R2 of 5%.

Table 5.8 2-level random intercepts for country and world risk perception with aggregate level variables and different measures of religion

	Country Risk (M12)	World Risk (M12)	Country Risk (M13)	World Risk (M13)	Country Risk (M14)	World Risk (M14)
Major Religion (Simplified)						
Eastern Religion	.55* (.22)	.38 (.25)				
Percentage of Christians			-.01* (.00)	-.01* (.00)		
Major Religion (Protestant)						
Other Christian					.51 (.26)	.20 (.23)
Eastern					.97* (.22)	.55 (.35)
GDP (Log)	.13 (.11)	34* (.10)	.08 (.09)	.31* (.08)	.19 (.10)	.36* (.10)
Government Restriction	-.16 (.10)	-.09 (.09)	-.15 (.09)	-.09 (.09)	-.24* (.09)	-.12 (.09)
Social Hostility	.10 (.11)	.09 (.10)	.05 (.11)	.06 (.09)	.24 (.11)	.10 (.10)
Constant	4.61* (1.18)	2.85* (1.08)	5.79* (.92)	3.66* (.85)	2.51* (1.59)	2.43* (1.09)
Var (Constant)	.21 (.07)	.16 (.04)	.17 (.06)	.13 (.03)	.17 (.05)	.15 (.04)
Var (Residual)	4.80 (.24)	4.95 (.27)	4.80 (.24)	4.95 (.27)	4.80 (.24)	4.95 (.27)
Observations (Countries)	34,305 (28)	34,353 (28)	34,305 (28)	34,353 (28)	34,305 (28)	34,353 (28)
ICC	.04	.03	.03	.03	.04	.03
Snijders/Bosker R-squared Level 1	.04	.06	.05	.07	.05	.07
Snijders/Bosker R-squared Level 2	.27	.49	.36	.55	.37	.51
AIC	128018.9	129182.2	128015.1	128178.9	128224.6	129329.6
BIC	128365.1	129528.4	128361.2	129525.1	128578.6	129684.3
**<0.05 P-value* *Controls Include all individual-level variables from M9 (Table 5.5)*						

Model 12 includes major religions coded as two categories – Christian and Eastern Religions (Buddhism, Daoism, Hinduism). This was done because the number of countries in some categories i.e. Hindu only contain one country, meaning it is impossible to establish a trend across countries of this major religion. The results indicate a substantial difference between Christian majority countries and the Eastern religion majority countries in terms of country-level risk perception, with the latter indicating .55 higher risk perception for (religious and non-religious) individuals living within these countries. This coincides with theoretical expectations that Christianity would lead to lower risk perception than the three religions included in the Eastern Religion category. This doesn't persist when testing for world risk perception, with a small, insignificant positive coefficient for Eastern religions. GDP has a significant effect on world risk perception (.34) and appears to account for a substantial proportion of the R^2 for this model, but not for country risk perception. The measures for religious fundamentalism appear to have little effect on risk perception.

Model 13 includes random intercepts with aggregate variables, with percentage of Christians replacing majority religion. The coefficients for both country risk and world risk are the same (.01) indicating that the higher the proportion of Christians in a country, the lower climate change risk perception will generally be. The implication of the result is that a country with 25% Christian inhabitants would be estimated to have half a point (.50) higher on the 11-point risk perception scale than a country which had 75% Christians. This measure most aptly tests the impact of current day populations and may map on to ongoing national discourses. It may also capture historical influence of Christian ideologies across countries to some extent, though is an imperfect measure as higher global migration and ideological shifts in the contemporary world has incurred shifting demographics across countries, meaning the capacity to capture longer-term institutional influence of religions is more limited with this measure. However, it provides another frame of analysis indicating differences across countries depending upon the religious demographics present. GDP retains its explanatory power for world risk perception, while the religious fundamentalism measures are still insignificant.

Model 14 shows the results for major religions separated to include Protestant countries, other Christian countries (Catholic and Orthodox) and the same Eastern religion as prior models. This indicates that individuals in Protestant countries indicate lower country risk perception than Eastern religion majority countries (.97) but not those in other Christian countries. Therefore, Protestantism does appear to have a larger negative effect on risk perception than other forms of Christianity included in the sample, as predicted in the theory section. Government restriction of religion also shows a significant negative effect on country risk perception (-.24). This does not persist for world risk perception, with smaller insignificant coefficients, but the largest coefficient for GDP across the models (.36).

The LR tests are above the critical value of 3.84 though they are not statistically significant (Turner et al. 1999). Meanwhile the ICC decreases from .05 in the 1-level random intercepts to .04 and .03 in M12 and M14 for country and world risk, respectively, and .03 for both measures in M13. Further, the AIC and BIC are lower for the level-2 models. Therefore, the inclusion of the aggregate level variables helps to explain some of the variation at the country level,

meaning that although the relative explanatory power of these models is higher for cross-country analysis, individual level contributors are more important for improving the models.

5.3.4 Cross-level interactions

This section includes the cross-level interaction of individual religious affiliation and GDP per capita. This aims to test the influence of religious affiliation in countries of different levels of wealth, as explored in the theory section. Chuvieco et al. (2016) indicate that proportion of religious groups can have varying effects on environmental performance indicators, with Atheist/Agnostic and Christian majority countries correlated with positive EPI scores, and no effect for Buddhist and Hindu countries. Ibid's findings contrast with those in the former section, with the proportion of Christians having a large negative effect of climate change risk perception. The following models explore differences in risk perception within populations, according to individual religious affiliation, across countries with varying levels of wealth.

Table 5.9 2-level random intercept with cross-level interaction between religious affiliation and GDP for country risk perception

	Country Risk (M15)	World Risk (M15)
Religious Affiliation (No Religion)		
Catholic	2.79* (1.27)	3.75* (1.19)
Protestant	3.16* (1.40)	4.49* (1.65)
Orthodox	4.46* (1.24)	4.38* (1.21)
Other Christian	3.94* (1.40)	5.34* (1.56)
Jewish	-2.88* (6.70)	-.20 (6.86)
Islamic	4.55* (1.16)	4.88* (1.25)
Buddhist	3.48 (1.86)	5.19* (1.86)
Hindu	4.79* (1.39)	3.88* (1.11)
Other Asian Religions	2.37 (2.42)	4.83* (1.86)
Other Religions	2.66 (1.91)	6.13* (1.31)
GDP (Log)	.37* (.13)	.65* (.11)
Religious Affiliation#GDP		
Catholic	-.27* (.12)	-.35* (.10)
Protestant	-.30* (.13)	-.43* (.15)
Orthodox	-.46* (.13)	-.46* (.12)
Other Christian	-.39* (.14)	-.53* (.15)
Jewish	.27 (.60)	.02 (.64)
Islamic	-.46* (.11)	-.49* (.12)
Buddhist	-.35 (.19)	-.49* (.20)
Hindu	-.47* (.17)	-.36* (.13)
Other Asian Religions	-.30 (.24)	-.50* (.19)
Other Religions	-.22 (.17)	-.54* (.16)
Constant	2.11 (1.39)	-1.87 (1.60)
Var (Religious Affiliation)	.06 (.01)	.04 (.01)
Var (Constant)	.46 (.08)	.38 (.06)
Var (Residual)	2.19 (.05)	2.22 (.06)
Observations (Countries)	34,305 (28)	34,353 (28)
ICC	.17	.14
Snijders/Bosker R-squared Level 1	.04	.7
Snijders/Bosker R-squared Level 2	.25	.51
AIC	127968.6	129133.9
BIC	128407.7	129573
**<0.05 P-value* *Controls Include all individual-level variables from M9 (Table 5.5)*		

The results shown for M15 (Table 5.9) indicate a potential cross-level interaction between religious affiliation and GDP. The positive effects for all religions, other than Judaism[18], for individual religious affiliation indicate that religious individuals in low GDP countries have higher risk perception than non-religious individuals. However, the interaction terms suggest that the positive effect of religion in high GDP countries is much smaller, meaning non-religious individuals in higher GDP countries align with religious individuals in terms of risk perception, shown in figure 5.5 below. Further, religious affiliation can have a negative impact on country

[18] This result is likely based on the fact that the population of Jewish individuals outside the USA is very small. Therefore the results for Judaism should not be interpreted as a reliable estimation of the interaction effect between GDP and this particular religion.

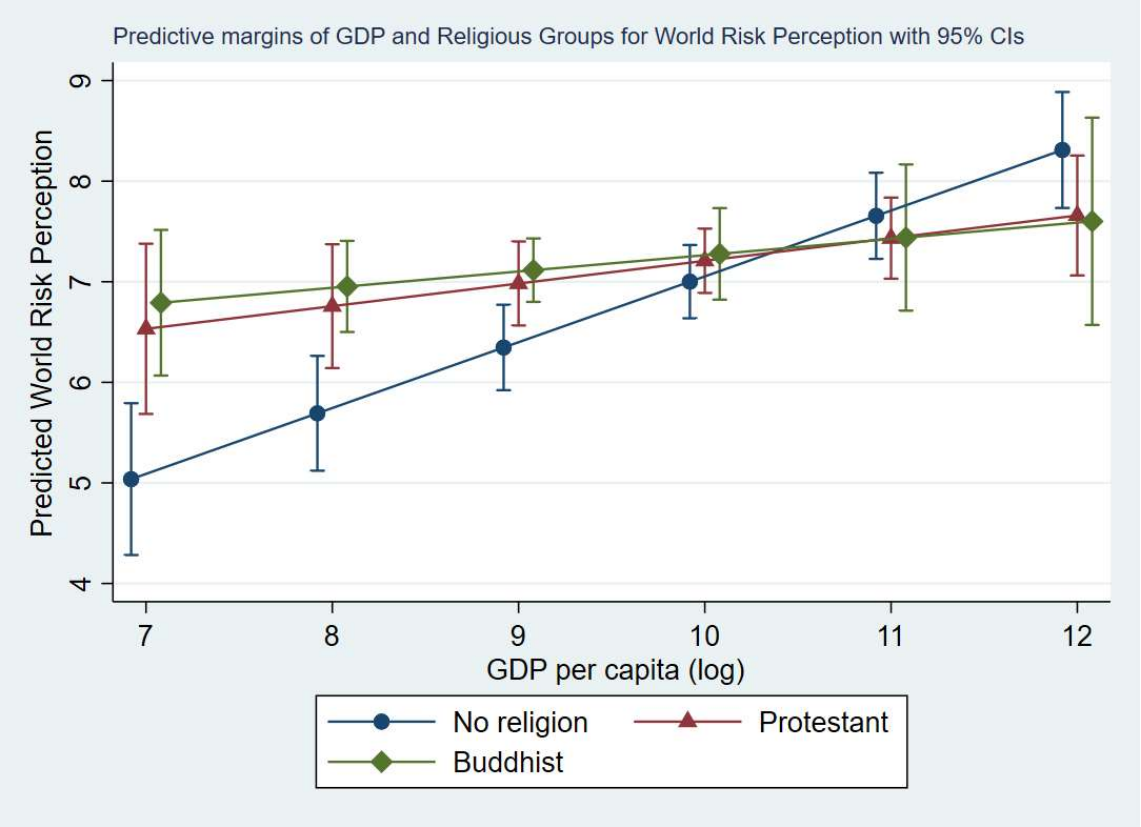
risk perception in high GDP countries, for individuals affiliated with Orthodox and other Christianity, Islam and Hinduism.

For example, for Orthodox Christians, in countries with lower than 16,305 GDP per capita (9.70 log), would be expected to have higher country risk perception than non-religious individuals with a slope coefficient of 4.46. In countries with around 16,305 GDP per capita, risk perception is expected to be equal between orthodox and non-religious individuals. However, once GDP per capita exceeds 16,305, non-religious individuals will have higher risk perception. This gap will increase .46 per unit of GDP per capita (log), which is explained by both the positive effect of non-religiosity in higher GDP countries (.37) and the negative effect of orthodox Christianity (-.09) in high GDP countries.

The results indicate that a similar cross-level interaction persists for world risk perception between religious affiliation and GDP. For all religious individuals, apart from Judaism, living in low GDP countries world risk perception is higher than non-religious individuals. Once again, this means that there is a bigger gap between non-religious individuals and individuals in these religions in lower GDP countries due to a smaller effect that religion has on individuals in high GDP countries. However, in the case of world risk perception, none of the religions included indicate a negative effect on world risk perception as GDP increases, merely a smaller positive effect in comparison to non-religion.

This provides evidence that religions generally have a positive effect on risk perception in lower GDP countries, however, have a smaller positive effect in higher GDP countries compared to non-religiosity. Further, some religions negatively impact country risk perception in higher GDP countries. The implications of these results are discussed below.

Figure 5.5 Cross-Level Interaction between GDP per Capita and Religious Affiliation on Country Risk Perception (M15)



The inclusion of other control variables in the below models (Table 5.10) was used to further validate the findings in the main models. M16 includes a simple regional measure of Western and Eastern countries. This was included to test the validity of the majority religion variable, as there was substantial crossover between region and major religion. However, the non-significant coefficients for region (-.31 and -.38), low R^2 and slightly higher AIC/BIC, for the model with the region variable signals that the majority religion variable explains the variation at the country level better than simple regional divides of East and West. Therefore, models dividing countries by majority religion or percentage of Christians provides more explanatory power than simply dividing them by geographical region.

Table 5.10 2-level random intercept with added control variables for country risk perception and world risk perception

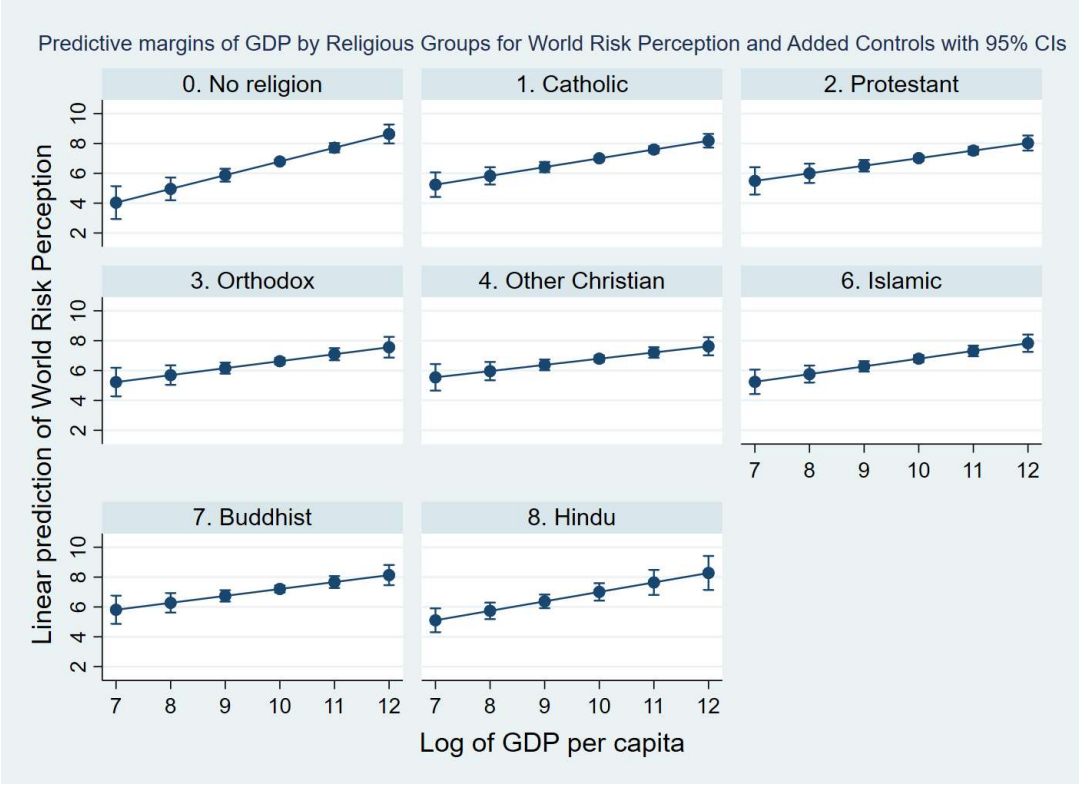
	CR (M16)	CR (M17)	CR (M18)	CR (M19)	CR (M20)**
Major Religion (Simplified)					
Eastern Religion	.82* (.32)	.32 (.18)			.23 (.20)
Major Religion (Protestant)					
Other Christian			.22 (.13)		
Eastern Religion			.53* (.20)		
Percentage Christian				-.01* (.00)	
GDP (Log)	.11 (.14)	.35* (.10)	.35* (.10)	.32* (.10)	.61* (.12)
Religious Affiliation#GDP					
Government Restriction	-.18 (.11)	-.00 (.10)	-.02 (.09)	-.02 (.09)	.07 (.09)
Social Hostility	.11 (.11)	-.09 (.09)	-.07 (.08)	-.11 (.08)	-.17 (.09)
Region					
Eastern Country	-.31 (.39)				
Emissions		-.12* (.05)	-.10* (.04)	-.12* (.04)	-.13* (.05)
CRI		-.01* (.00)	-.01* (.00)	-.01* (.00)	-.01* (.00)
CCPI		-.02* (.01)	-.02* (.01)	-.02* (.01)	-.03* (.01)
Constant	4.98* (1.56)	5.09* (.87)	4.45* (.84)	5.76* (.78)	2.72* (1.13)
Var (Rel Aff.)					.06 (.01)
Var (Constant)	.20 (.07)	.34 (.04)	.33 (.04)	.32 (.03)	.32 (.04)
Var (Residual)	4.80 (.24)	4.80 (.24)	4.80 (.24)	4.80 (.24)	4.80 (.24)
Observations (Countries)	34,305 (28)	34,305 (28)	34,305 (28)	34,305 (28)	34,305 (28)
ICC	.04	.13	.13	.13	.13
S/B R-squared L1	.04	.06	.06	.06	.06
S/B R-squared L2	.27	.58	.59	.63	.61
AIC	128228.1	128009.8	128010.5	128006.2	127955.3
BIC	128582.8	128381.3	128390.5	128377.7	128419.7
	WR (M16)	**WR (M17)**	**WR (M18)**	**WR (M19)**	**WR (M20)****
Major Religion (Simplified)					
Eastern Religion	.72 (.39)	.40 (.23)			.36 (.25)
Major Religion (Protestant)					
Other Christian			.11 (.16)		
Eastern Religion			.51 (.28)		
Percentage Christian				-.01* (.00)	
GDP (Log)	.30* (.14)	.47* (.00)	.48* (.10)	.44* (.09)	.79* (.11)
Religious Affiliation#GDP					
Government Restriction	-.12 (.11)	-.04 (09)	-.05 (.09)	-.06 (.08)	.04 (.08)
Social Hostility	.10 (.10)	.00 (.10)	.01 (.11)	-.03 (.09)	-.09 (.11)
Region					
Eastern Country	-.38 (.43)				
Emissions		-.08 (.04)	-.07 (.04)	-.08* (.04)	-.08* (.04)
CRI		-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)
CCPI		-.01 (.01)	-.00 (.01)	-.00 (.01)	-.01 (.01)
Constant	3.30* (1.52)	2.58* (.97)	2.24* (.96)	3.40* (.86)	-.55 (1.21)
Var (Rel Aff.)					.00 (.00)
Var (Constant)	.15 (.05)	.36 (.04)	.36 (.04)	.33 (.03)	.12 (.03)
Var (Residual)	4.95 (.27)	4.95 (.27)	4.95 (.27)	4.95 (.27)	4.94 (.27)
Observations (Countries)	34,353 (28)	34,353 (28)	34,353 (28)	34,353 (28)	34,353 (28)
ICC	.03	.14	.14	.13	.13
S/B R-squared L1	.07	.07	.07	.07	.07
S/B R-squared L2	.50	.58	.58	.65	.60
AIC	129330.6	129183.2	129184.9	129178.2	129134.6
BIC	129684.6	129554.7	129564.9	129549.8	129599.1

**<0.05 P-value.*
Controls Include all individual-level variables from M9 (Table 5.5)
*** Full interaction effect model included in appendix (Table 9.10)*

Further controls are all broadly related to climate change and often used in analyses from the literature. The measures were taken from 2020-21 databases to match the dates when the ISSP survey data was collected. Emissions per capita (GCB, 2021) and CCPI are both measures of climate change performance, with the former being single indictor and the CCPI collecting being based on several metrics including GHG emissions, renewable energy, energy use and climate policy (Burck et al. 2020). CRI is an index of climate change risk for individual countries (Eckstein et al. 2021). The models imply decreases in explanatory power for countries grouped by major religions. The differences between Eastern religious majorities and all Christian denominations are relegated to statistically insignificant coefficients for both country and world risk perception (.32 and 40). However, the coefficients for Eastern Religion and Protestant countries retains its explanatory power for country risk perception, though with a markedly smaller coefficient, down from .97 in M14 to .53 in M18. The models including percentage of Christians retain their effects from the prior models without the added controls and provide the highest level-2 R^2, implying this measure is an important contributor to both country and world risk perception. Therefore, it is reasonable to argue that aggregate level religious factors are useful explanatory variables for risk perception, particularly country risk perception, and should be subject to further research in the future.

GDP also indicates higher coefficients for world risk perception with the added controls .47 in M17 compared to .34 in M12, and the coefficient for country risk is higher and statistically significant in the control model (.35). Furthermore, the interaction effects (M20) indicate similar trends across religious groups as M15, shown in figure 5.6 below.

Figure 5.6 Cross-Level Interaction between GDP per Capita and Religious Affiliation on World Risk Perception with additional controls (M20)



5.4 Conclusion

Altogether the multilevel model analysis has provided further understanding of the influence of political affiliation and both individual-level and aggregate-level religious factors. The models have provided clarity regarding the effects of sociological factors including religion and political affiliation, with a more extensive understanding of individual and aggregate level elements of religion providing evidence for the theory underpinning the analysis and filling a gap within the climate change risk perception literature. The importance of cognitive, effective, social and cultural contributors to risk perception noted in the literature review and theory (Van der Linden, 2017) indicated that there would be substantial variation unaccounted for in these models, and this is true for individual level contributors, with R^2 less than 10% explained by these contributors alone. However, the overall variation explained at the country level is quite high, with R^2 exceeding 50% in most cases and residual variation reduced by more than half in

the 2-level models compared to the variance component model. This analysis has effectively identified important macro-level contributors to variation in climate change risk perception across countries. The following section will discuss these findings in the context of theoretical expectations and literature.

Postmaterialism is not an important contributor for country-risk perception, though it does indicate higher world risk perception compared to materialism. This effect is small, however it does concur with some literature regarding the importance of postmaterialism relating to climate concern (Tranter, 2011; Tranter & Booth, 2015). The mechanism for postmaterialist's higher world risk perception is not clearly understood, with ongoing debate relating to its relationship to contextual economic indicators (Kenny (2020) and national wealth (Hoffman et al. 2022). The findings somewhat align with the latter, indicating that higher levels of country-level wealth indicate higher world risk perception, and this is shown to coincide with the effect of postmaterialism itself on the individual-level. It is reasonable to posit that as well as the existing, though often minor, asymmetry in the interpretations of both country and world risk perception, there are asymmetric contributors to both risk perception measures. It is arguable that postmaterialist perspectives engender a view of climate change as an important global issue more effectively than materialist ones, as suggested by Booth (2016), and this is not necessarily the case for country risk perception, where more specific national issues may take precedence over broader value perspectives.

Sociodemographic variables have an impact on climate change risk perception across the 28 countries. Older individuals, as expected from the literature, have lower risk perception. This is true for males compared to females too, with the former having lower risk perception. This result is interesting as literature has indicated a declining role for sex in many countries, however with a larger number of countries the trend indicates the ongoing explanatory power for the gender gap. Education is an important contributor to varying levels of climate change risk perception, with those achieving above upper secondary education linearly predicting higher climate change. Income is not an important factor across most of the 28 countries.

For individual religious affiliation the results aren't as clear, with negative coefficients for Abrahamic religions, other than Judaism, as expected, though the lack of significant results means that firm conclusions cannot be reached. This is true for Buddhism too, which does indicate slightly higher risk perception than no religion, but the results can't be considered conclusive of this trend. The random slopes for religious affiliation did not improve model fit, unlike those for political affiliation which will be discussed in the next chapter. There is clear evidence that attendance of religious services tends to decrease risk perception in the cases of both risk perception measures, which implies that the regularity of religious practice may be a more consistent contributor to variation in risk perception than affiliation on the individual-level.

The inclusion of aggregate level variables has provided some important findings. Through testing majority religions for both individual religions and then Christianity against Eastern Religions (Buddhism, Daoism, and Hinduism) evidence shows that there are substantial differences in risk perception between countries by majority religion. Firstly, individuals in Protestant countries have lower country-risk perception than Buddhist, Buddhists/Daoist and Hindu countries. This shows that while individual religious affiliation is not important in most countries, living in a Buddhist, Buddhist/Daoist and Hindu countries is associated with higher risk perception compared to those who live in protestant countries. The same goes for those living in countries with Eastern Religion majorities compared to Christian countries. This implies that national discourse within these countries varies to the extent that individual's climate change conception is impacted, regardless of religion. Therefore, historical religious value systems and institutionalisation of different religions may indeed have an impact on climate change perceptions, even in increasingly secularised and irreligious countries, coinciding with White (1967). Skirbekk et al.'s (2020) conclusions regarding the potential for varying climate change strategies depending on majority religious affiliation, should therefore be explored in the context of entire populations to a certain extent too, meaning even more religiously pluralistic countries may be influenced by institutionalised religious ideologies and traditions.

An alternative measure of proportion of Christians in a country was used as a macro measure and proved to be an important measure across all models in which it was included. This

measure effectively captures differences across countries depending on demographics and will likely coincide with the influence of religion on a country's institutional characteristics to some extent. For example, a higher proportion of Christians in a country likely correlates with historical and contemporary influence of Christian ideology on a country's institutions i.e. influence of the church, discourse guided by specific religious principles, attitudes towards science, and so on. This is an important finding as it shows that while religion is commonly utilised as an individual-level measure, its inclusion as an aggregate level measure highlights its influence on the entire population of a country, not just individual adherents.

This justifies analysis of the relationship between climate change attitudes and religion from both individual-level and institutional level lenses. However, this specific measure is imperfect for this analysis. While Christian populations have increased in many countries around the world over the last few decades, the influence of Christianity on the institutions of countries with populations largely affiliated with other religions i.e. Japan, India, etc. is likely close to none, particularly from the historical perspective. From a contemporary perspective, it could be argued that as contemporary globalised capitalism has Christian, and more specifically protestant roots, there is evidence of institutional influence within these countries. However, there is no evidence that this influence is in direct proportion to the number of Christians living in a country. Despite these issues, within the underpinning theoretical framework alongside the other aggregate measures, the measure does help provide a clearer picture of the potential influence of religion across countries.

While this is difficult to link directly to the theoretical expectations regarding anthropocentrism and free will's impact on climate change risk perception, it does coincide with the typology in the sense that Christianity likely leads to lower risk perception from a country-level perspective than Buddhism, Daoism and Hinduism. It would be interesting to test the other Abrahamic religions from this perspective too, which unfortunately wasn't possible in this research due to the lack of majority Jewish and Muslim countries in the sample. There is also little evidence of potential interpretations of climate change as an apocalyptic or otherwise religious event which was considered in the theory section, particularly due to the weaker effects of the religious variables on world risk perception, which would be the metric most likely to correspond with

the cognitive association of climate change and apocalyptic beliefs. Explicit understandings of the mechanisms that lead to the differences between religions are important to pursue due to the likelihood that any potential causal relationships are complex (Curry, 2008; Eckberg & Blocker, 1996). A survey pertaining to questions of free will and anthropocentrism, as well as other qualitative aspects of religious philosophy would enable these questions to be answered more satisfactorily.

The macro-level measures of fundamentalism, namely government restrictions and social hostility to religious minorities, did not indicate any substantive effect on risk perception in the main models. This could imply that contemporary religious practices are less impactful than general religious philosophies, which is also indicated by the weakness of individual level religious affiliation. However, it could also be that religious fundamentalism holds little sway in a majority of the countries in the sample, many of which are pluralist and/or secular societies, and the potential effects of fundamentalist beliefs may be better captured by the inclusion of individual-level attendance of religious services and religious affiliation, wherein individual religious beliefs are likely to be more impactful. It should be noted that the later control model including all aggregate level variables did indicate a negative role for religious fundamentalism. Religious fundamentalism was forwarded as a potential contributor to risk perception in the sense that it may intensify the effect of religiosity, i.e. a religion disposed to lower risk perception may show this disposition more clearly in a country with higher levels of religious fundamentalism.

This may still be the case, with an analysis of religious fundamentalism that pertains to specific beliefs on the individual level. Many studies have pursued similar forms of analysis, where respondents were asked about 'importance of God in their lives' alongside other questions (Mostafa, 2016). This could be expanded in the case of environmentalism with questions pertinent to the issue situated in religious language i.e. how much respondents agree with the statements 'humans have a responsibility to act as stewards for life on earth'; 'humans have dominion over life on earth', 'human's relationship with nature should be harmonious', etc.

The cross-level interactions for GDP and religious affiliation provide evidence of asymmetric effects of religiosity across countries, showing that religious individuals generally indicate higher risk perception in lower GDP countries. However, as GDP increases, this effect gets smaller, with higher GDP countries indicating similar or lower risk perception for religious individuals than non-religious individuals. This indicates that the influence of a religion can be substantially different across countries with different levels of per capita wealth. Further studies with a greater number of countries and variation in GDP per capita would be interesting to observe these potential effects as the relatively small number of countries is likely not be providing the bases for generalisable or firm conclusions regarding this potential interaction between GDP and religious affiliation on climate change risk perception.

6. Understanding the effect of political affiliation and its associated mechanisms on climate change risk perception across 28 countries.

6.1 Introduction

This section presents further analysis of climate change risk perception across 28 countries. The analysis focuses on research questions relating to the importance of postmaterialism and politics on climate change risk perception. The univariate and bivariate analyses are included in Chapter 5 alongside the analysis of religion. This section begins with a focus on the variation in the effects of political affiliation across countries, which aims to determine how similarly affiliated individuals vary across countries. Notable consistency is identified amongst left/far left affiliated, which implies a level of ideological homogeneity across countries. On the other hand, other ideological groups (e.g. centre-right, right/far right) vary substantially across the 28 countries, which emphasises the importance of country-specific differences in multilevel research. Following this, interactions are explored which aim to identify moderating effects on politics, which may help to identify some reasons for this identified variation. These include postmaterialism and attendance of religious services on the individual-level, which will help identify how individual-level values can intersect to impact climate change risk perception. Further, cross level interactions with GDP per capita and majority religion aim to identify possible trends across countries in terms of wealth and institutional differences, which also exert varying effects on different political ideologies. This analysis aims to provide clarity regarding the reasons for variation across and within political ideologies when it comes to climate change risk perception.

6.2 Multilevel Models

The following section presents the analysis of the effect of politics and postmaterialism across 28 countries upon risk perception. M21 (Table 6.1) is the same as those presented in the last chapter (Table 5.5). This is included to allow for a brief discussion of the results of simple level-1 random intercept, which in-part guided the further analysis presented in this chapter. Political affiliation is a factor across the 28 countries, with .42 higher country and world risk perception predicted for left/ far-left affiliated individuals compared to centre-affiliated individuals on the 11-point climate change risk perception scale. Meanwhile, right/far-right individuals have

generally lower risk perception (-.39 country risk and -.43 world risk). Centre-right individuals also indicate .34 lower world risk perception. This is generally in line with literature relating to the effect of politics on risk perception, though requires further analysis as the mix of 28 countries contains substantial variation. The next section includes random slopes models which will further explore this variation, while also attempting to explain the mechanisms behind the different effects of various political ideologies on climate change risk perception.

Table 6.1 Mixed Effects Random intercept model for country risk perception with individual-level variables

	M21 (Country Risk)	M21 (World Risk)
Political Affiliation (Centre/Centre-left)		
Centre Left	.22 (.13)	.16 (.13)
Left/Far Left	.42* (.11)	.42* (.12)
Centre Right	-.26 (.15)	-.34* (.15)
Right/ Far Right	-.39* (.19)	-.43* (.21)
Refused/Didn't vote	-.02 (.10)	-.04 (.10)
Religion (No Religion)		
Catholic	-.05 (.07)	-.02 (.06)
Protestant	-.12 (.10)	-.13 (.11)
Orthodox	-.17 (.15)	-.25 (.18)
Other Christian (Varies by country)	-.15 (.11)	-.20 (.12)
Jewish	.14 (.25)	.10 (.34)
Islamic	-.16 (.19)	-.22 (.15)
Buddhism	.17 (.15)	.18 (.13)
Hindu	.05 (.23)	-.15 (.16)
Other Asian Religions (Varies by country)	.00 (.10)	-.04 (.06)
Other (Varies by country)	.18 (.16)	.31 (.17)
Attendance of Religious Service (Never)		
Once a month or less	-.13* (.04)	-.13* (.04)
More than once a month	-.27* (.09)	-.31* (.09)
Postmaterialism (Materialist)		
Postmaterialist	.08 (.07)	.15* (.07)
Neither	-.06 (.04)	-.01 (.05)
Personal Efficacy	.12* (.03)	.13* (.03)
Collective Efficacy	.12* (.02)	.14* (.03)
Age	-.01* (.00)	-.01* (.00)
Sex (Male)	.14* (.04)	.11* (.03)
Education (Upper Secondary)		
No Education	-.03 (.17)	.06 (.13)
Primary	.04 (.07)	.05 (.09)
Lower Secondary	-.01 (.05)	.00 (.05)
Post-secondary/Short-cycle tertiary	.03 (.05)	.05 (.06)
Lower tertiary (BA)	.17* (.04)	.18* (.05)
Upper tertiary (MA)	.28* (.07)	.37* (.09)
Post-tertiary (PhD)	.46* (.12)	.67* (.09)
Income (25% Quartile)		
Lower middle	-.02 (.03)	.07 (.04)
Upper middle	.03 (.05)	.12* (.05)
Upper Quartile	-.00 (.07)	.11 (.07)
No answer/ refused	.01 (.06)	.03 (.06)
Constant	6.00* (.19)	6.41* (.17)
Var (Constant)	.50 (.07)	.49 (.05)
Var (Residual)	2.19 (.06)	2.23 (.06)
Observations (n of Countries)	34,305 (28)	34,353 (28)
ICC	.05	.05
LR Test vs VCM	24866.97*	25603.3*
Snijders/Bosker R-squared Level 1	.04	.05
Snijders/Bosker R-squared Level 2	.11	.25
AIC	128016.3	129185
BIC	128328.7	129497.4
**<0.05 P-value.*		

6.2.1 – Random Slopes models

The random slopes models indicate some important cross-country dynamics. Centre left and left/far left affiliated individuals indicate higher risk perception than centre parties in most countries, with this trend being particularly strong for left/far left affiliated individuals. There is low variation between countries for this effect too, with the random effects parameter for left/far left affiliated at .02. This means the effect of left political affiliation is quite stable in predicting higher country-level risk perception across the 28 countries. There is slightly more variation for centre left though this is still fairly consistent (.16). The variation for centre right (.25) and far right (.38) is significantly higher although the slopes show a decrease in country-risk perception across the majority of countries relative to the centre parties, with this effect being largest for right/far right individuals.

Table 6.2 Random slopes models for political affiliation categories on climate change risk perception

	M22 (Country Risk)	**M22 (World Risk)**
Political Affiliation		
Centre Left	.22* (.13)	.16 (.13)
Left/Far Left	.42* (.11)	.42* (.12)
Centre Right	-.26* (.15)	-.34* (.15)
Right/ Far Right	-.39* (.19)	-.43* (.21)
Refused/Didn't Vote	-.02 (.10)	.04 (.10)
Constant	4.62* (1.17)	2.85* (1.08)
Var(Centre Left)	.16 (.06)	.12 (.04)
Var(Left/Far Left)	.02 (.02)	.05 (.03)
Var(Centre Right)	.25 (.08)	.23 (.09)
Var(Right/Far Right)	.38 (.15)	.39 (.16)
Observations (Countries)	34,305 (28)	34,353 (28)
ICC	.04	.03
AIC	128009.4	129171.2
BIC	128330.2	128482.1
**<0.05 P-value.* *Controls include all individual-level variables from M21 (Table 6.1)*		

As shown in figure 6.1, centre-left in Slovakia, Taiwan, and Korea have substantially smaller slopes relative to centre-left individuals in other countries, while the those in Switzerland, New Zealand and Australia have higher relative to the other countries. The differences between the far-left in other countries are very small, with consistent risk perception across the category. This indicates a greater amount of ideological homogeneity for left/far-left individuals across countries, regardless of country factors, when it comes to climate change risk perception. The centre-right shows the US and Australia, have more negative slopes than the average, with

politics having been identified as large contributors in these countries in the literature. Iceland and Switzerland also indicate significantly smaller slopes for centre-right individuals relative to other countries, though the variation appears to be more minor for Switzerland in particular. Meanwhile, Japan, Hungary, Croatia, India, Austria and Taiwan show the centre-right in these countries have a positive effect relative to other countries. Meanwhile, New Zealand and Spain show larger effects for the far right, while relatively higher risk perception for Italy, Korea and France.

The random slopes model for world risk perception indicates similar trends to those for country risk perception. There are upward trends for centre left and left/far left affiliated individuals in most countries, with this trend being quite strong for left/far left affiliation once again. There is low variation between countries for this effect, with the random effects parameter for left/far left affiliated at .05. This means the effect of left/ far left political affiliation is quite stable in predicting higher world-level risk perception across the 28 countries. There is slightly more variation for centre left though this is still fairly consistent (.12). The variation for centre right (.23) and far right (.39) is significantly higher although the slopes show a decrease in country-risk perception across the majority of countries, with this effect being largest for right/far right individuals.

Figure 6.1 Random slopes for countries country risk perception by political affiliation category (M22)

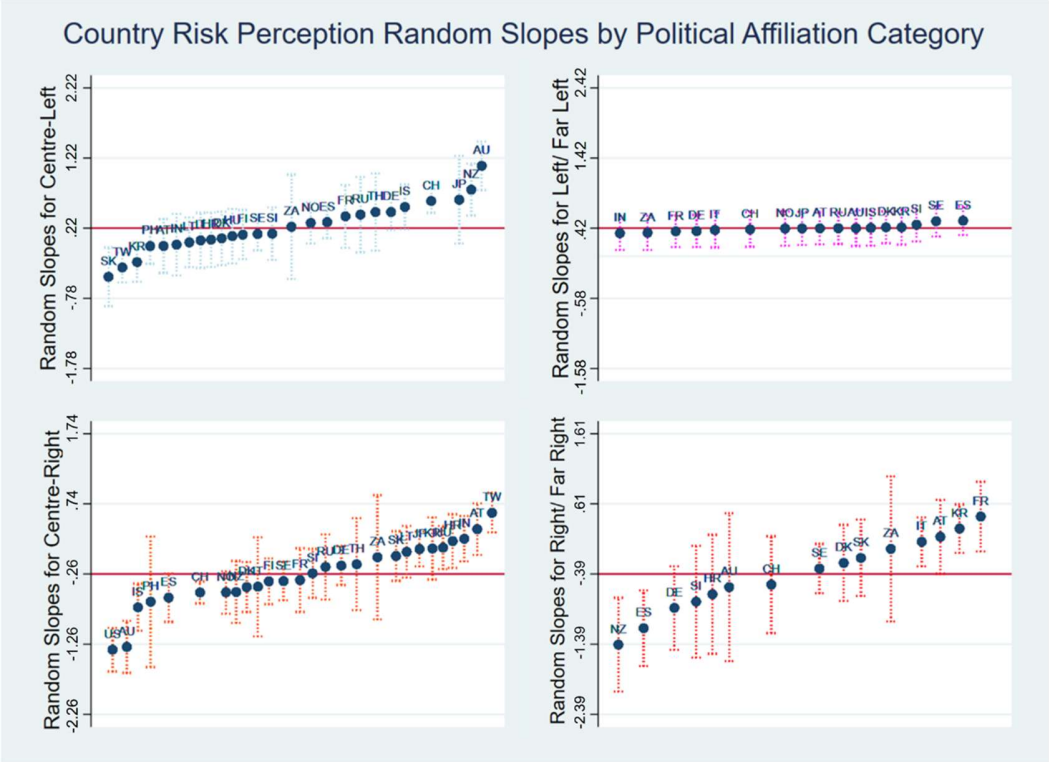


Table 6.3 Mixed effects random slopes models for political affiliation with interaction terms for postmaterialism and attendance of religious services

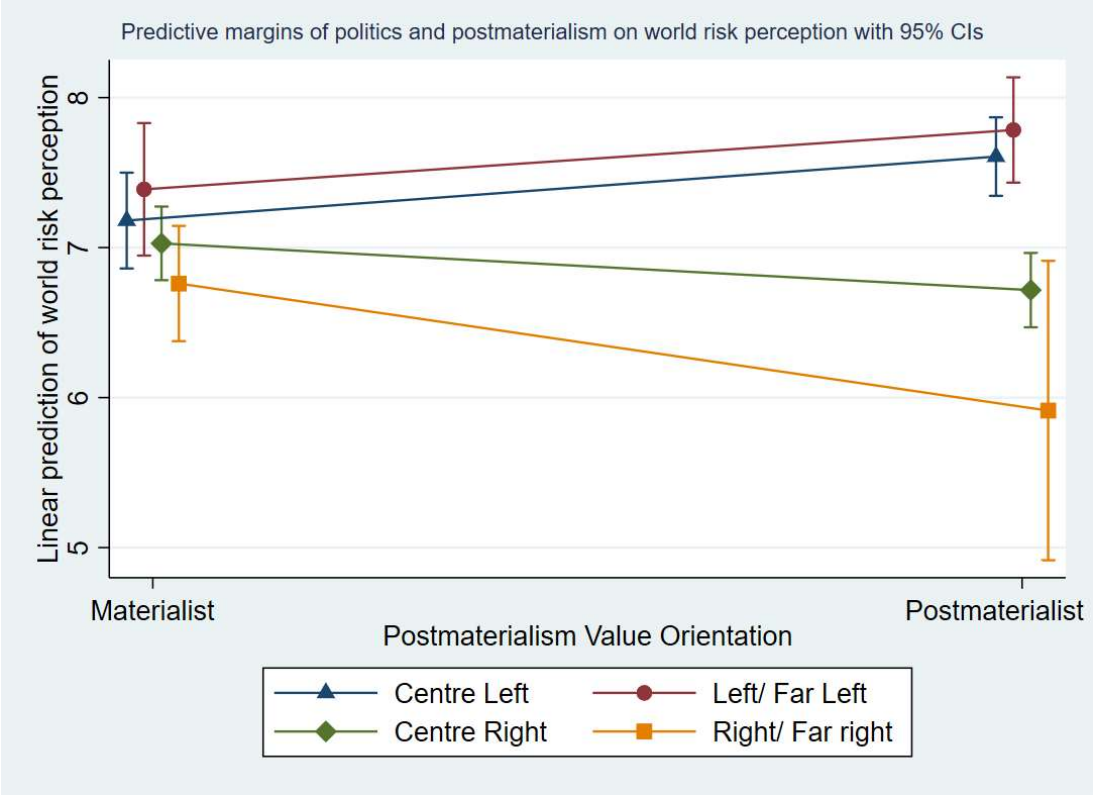
	M23 (Country Risk)	M23 (World Risk)	M24 (Country Risk)	M24 (World Risk)
Political Affiliation (Centre/Centre-left)				
Centre Left	.07 (.12)	.01 (.13)	.19 (.16)	.10 (.20)
Left/Far Left	.27 (.25)	.20 (.23)	.33* (.17)	.32* (.14)
Centre Right	-.07 (.12)	-.14 (.11)	-.50* (.20)	-.57* (.24)
Right/ Far Right	-.01 (.26)	-.09 (.22)	-.44* (.38)	-.57* (.30)
Refused/Didn't vote	-.03 (.08)	-.05 (.07)	-.15 (.16)	-.20 (18)
Attendance of Religious Service (Never)				
Once a month or less			-.33* (.10)	-.29* (.10)
More than once a month			-.31* (.16)	-.45* (.18)
Postmaterialism (Materialist)				
Postmaterialist	.25 (.17)	.36* (.17)		
Neither	-.06 (.12)	.02 (.10)		
Political Affiliation # Postmaterialism				
Postmaterialist# Centre Left	.24 (.20)	.17 (.20)		
Postmaterialist# Left/ Far Left	.08 (.34)	.09 (.39)		
Postmaterialist# Centre Right	-.68* (.25)	-.73* (.26)		
Postmaterialist# Right/Far Right	-1.52* (.48)	-1.47* (.50)		
Postmaterialist# Didn't Vote	-.13 (.17)	-.16 (.19)		
Neither# Centre Left	.18 (.14)	.14 (.15)		
Neither# Left/ Far Left	.18 (.27)	.26 (.26)		
Neither# Centre Right	-.22 (.17)	-.25 (.15)		
Neither# Right/Far Right	-.38 (.21)	-.37 (.20)		
Neither# Didn't Vote	-.03 (.14)	.02 (.13)		
Political Affiliation # Attendance				
Centre Left # Once a month or less			.06 (.13)	.03 (.14)
Left/Far Left # Once a month or less			-.17 (.24)	-.10 (.27)
Centre Right # Once a month or less			.17 (.22)	.09 (.22)
Right/ Far Right # Once a month or less			-.19 (.23)	-.02 (.30)
Refused/Didn't vote # Once a month or less			.37* (.12)	.27 (.16)
Centre Left # More than once a month			.01 (.18)	.20 (.22)
Left/Far Left # More than once a month			.10 (.26)	.15 (.26)
Centre Right # More than once a month			-.30 (.42)	-.00 (.42)
Right/ Far Right # More than once a month			.19 (.10)	.17 (.13)
Refused/Didn't vote # More than once a month			.11 (.17)	.28 (.20)
Constant	6.00* (.18)	6.40* (.14)	6.15* (.23)	6.58* (.21)
Var (Political Affiliation)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Var (Postmaterialism)	.01 (.01)	.01 (.00)		
Var (Attendance)			.04 (.01)	.03 (.01)
Var (Constant)	.24 (.06)	.23 (.06)	.36 (.10)	.30 (.08)
Var (Residual)	4.78 (.24)	4.93 (.27)	4.77 (.24)	4.93 (.27)
Observations (Countries)	34,305 (28)	34,353 (28)	34,305 (28)	34,353 (28)
ICC	.05	.04	.07	.06
Snijders/Bosker R-squared Level 1	.04	.05	.04	.05
Snijders/Bosker R-squared Level 2	.12	.26	.11	.26
AIC	127959.1	129122.8	127956.2	129138.1
BIC	128372.8	129536.6	128369.9	129551.9
**<0.05 P-value.* *Controls include all individual-level variables from M21 (Table 6.1)*				

Political Affiliation and Postmaterialism

The moderation terms in M23 for politics and postmaterialism show the effect that varying value systems within political affiliation categories can have a meaningful impact upon climate

change risk perception. The differences between materialist individuals of varying political affiliations are very small and statistically insignificant. Due to the wide confidence intervals, it is not possible to determine whether this also establishes a difference between materialists and postmaterialists of the same political affiliation. However, as shown in figure 6.2, the coefficients for centre-right (-.68/-.73) and right/far-right (-1.52/-1.47) affiliated postmaterialists clearly indicate significantly lower risk perception for these groups compared to centre-left and far-left affiliated postmaterialists. This indicates that the differences between political groups may be partly explained by contrasting political ideologies with broadly similar priorities i.e. free speech and democratic representation. These models emphasise that varying value systems within political ideologies is an important consideration in the established connection between political ideology and climate change risk perception.

Figure 6.2 Predicted estimates for countries world risk perception by political affiliated materialists and postmaterialists (M23)



Political Affiliation and Attendance of Religious Services

The results for attendance indicate that centre-affiliated individuals who attend religious services more than once a month have significantly lower country (-.31) and world risk perception (-.45) than those who never attend. The interactions effects for other political groups do not indicate any notable significant results.

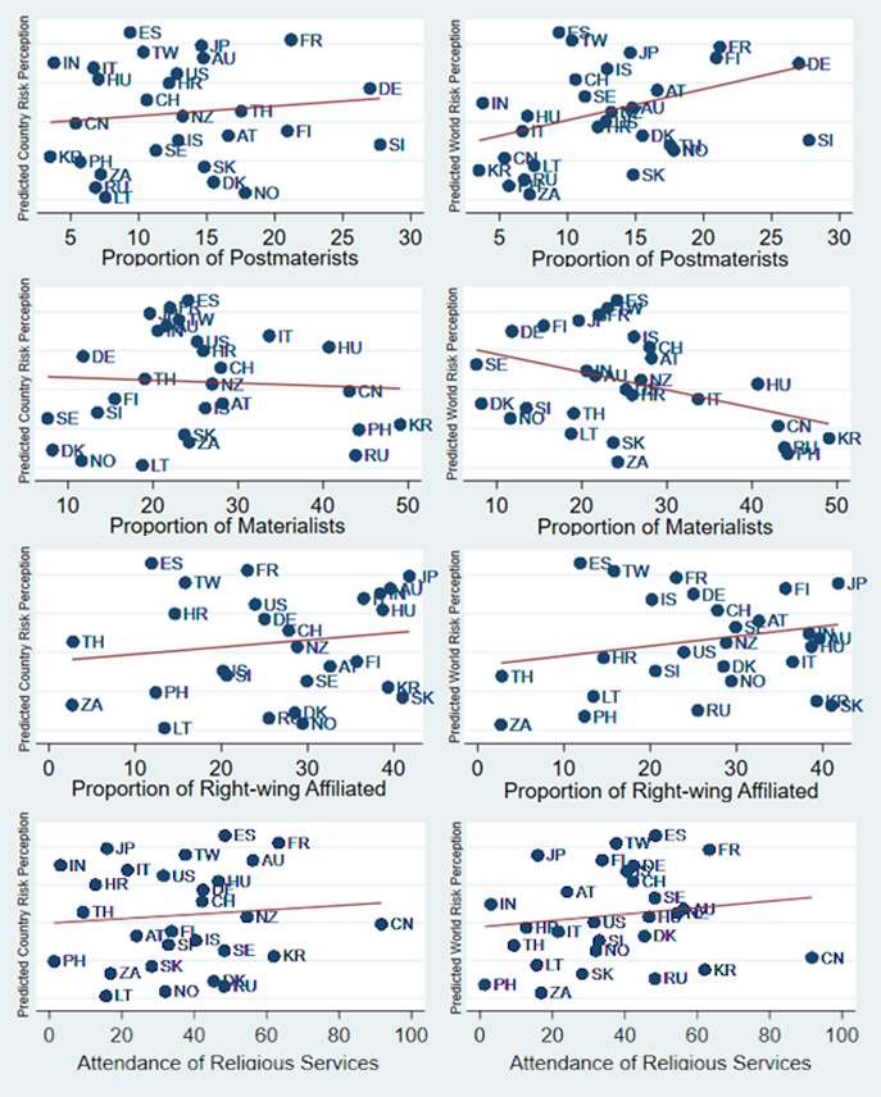
6.2.2 2-level random intercept models with country-level predictors

The following section presents the multilevel analysis with aggregate level variables included. This begins with bivariate analysis of risk perception with the aggregate level variables, which are then added to the random intercept models.

Table 6.4 Bivariate analysis of risk perception with aggregate level politics and postmaterialism variables

	Country Risk Perception			**World Risk Perception**		
	Pearson	Spearman	R^2	Pearson	Spearman	R^2
GDP (log)	.05		.05	.12		.12
Majority Religion	.05	.34	.05	.00	.29	.00
Proportion of Postmaterialists	.00		.00	.02		.02
Proportion of Materialists	-.00		.00	-.01		.01
Proportion of Right-wing affiliated	-.00		.00	.00		.00
Proportion of Religious Attendees	.01		.01	.01		.01

Figure 6.3 Bivariate relationship between aggregate level variables and estimated risk perception random intercept with individual level risk perception (Table 6.4)



The results for the bivariate analysis of aggregate-level variables and predicted country risk perception indicate that democracy matrix (Hans-Joachim & Schlenkrich, 2020) has a weak positive correlation for both country and world risk perception (Figure 6.3). This is also the case for proportion of postmaterialists, proportion of right-wing affiliated and religious attendance[19]. Meanwhile, proportion of materialists is negatively correlated. The lines of best

[19] 100 on the religious attendance scale means 100% of the population do not attend any religious services. 0 would mean everyone attends religious services at least once a year.

fit are for world risk perception and are steeper than those for country risk perception for all aggregate variables other than proportion of right-wing affiliated, indicating that these relationships may offer more explanatory power for world risk perception.

Table 6.5 2-level random intercepts for country and world risk perception with aggregate level politics and postmaterialism variables

	M25 (Country Risk)	M25 (World Risk)
Major Religion (Simplified)		
Eastern Religion	.55* (.18)	.44* (.18)
GDP (Log)	.09 (.10)	.26* (.12)
Proportion of Postmaterialists	.01 (.01)	.02 (.02)
Proportion of Right-wing	-.00 (.01)	.00 (.01)
Constant	4.88* (.84)	3.43* (1.12)
Var (Constant)	.22 (.07)	.15 (.04)
Var (Residual)	4.75 (.25)	4.93 (.29)
Observations (Countries)	32,296** (27)	32,352** (27)
ICC	.05	.03
Snijders/Bosker R-squared Level 1	.04	.07
Snijders/Bosker R-squared Level 2	.23	.52
AIC	121021.3	122264
BIC	121365	122607.8
**<0.05 P-value.* ***China is missing from models due to country-level politics variable.* *Controls include all individual-level variables from M21 (Table 6.1)*		

M26 shows the results for 2-level random intercept models with the aggregate level variables included for the analysis of politics and postmaterialism. Countries with majorities of Eastern Religions indicate higher country risk perception than Christian countries (.55). GDP (.09), postmaterialists (.01), rightwing affiliated (-.00), have no significant effect on country risk perception. The model explains 23% of the variance at the country level, compared to 11% in the model with only individual-level variables (M21 CR) (See Table 5.1). For world risk, majority religion has a significant positive effect (.44), slightly smaller than for country risk. GDP has a larger, positive coefficient and is statistically significant (.21). Once again, the other variables have insignificant coefficients. The level-2 R^2 indicates 52% of the variation at the country level is explained by this model, compared to 25% in the model with only individual-level variables (M21 WR).

The inclusion of the aggregate-level politics and postmaterialism offers a point of comparison to the aggregate measures included in Chapter 4 (Table 4.8). Major Religion and GDP have similar coefficients across M12 (See Chapter 4) and M25. M25 offers a similar level of explanatory

power to models 12, 13 and 14, which were similar models with varying measures for majority religion. In each case, the R^2 for M12 (27%), M13 (36%) and M14 (37%) was higher for country-level risk perception compared to M26 at 23%. For world risk, M25 explains 52% of the variation, higher than M12 (49%) and M14 (51%) but lower than M13 (55%). However, the AIC and BIC for M25 is significantly lower than M12, M13 and M14, indicating better model fit overall.

6.2.3 Cross Level Interactions

Table 6.6 2 Level Random slopes with cross-level interactions for political affiliation on climate change risk perception by majority religion and GDP per capita

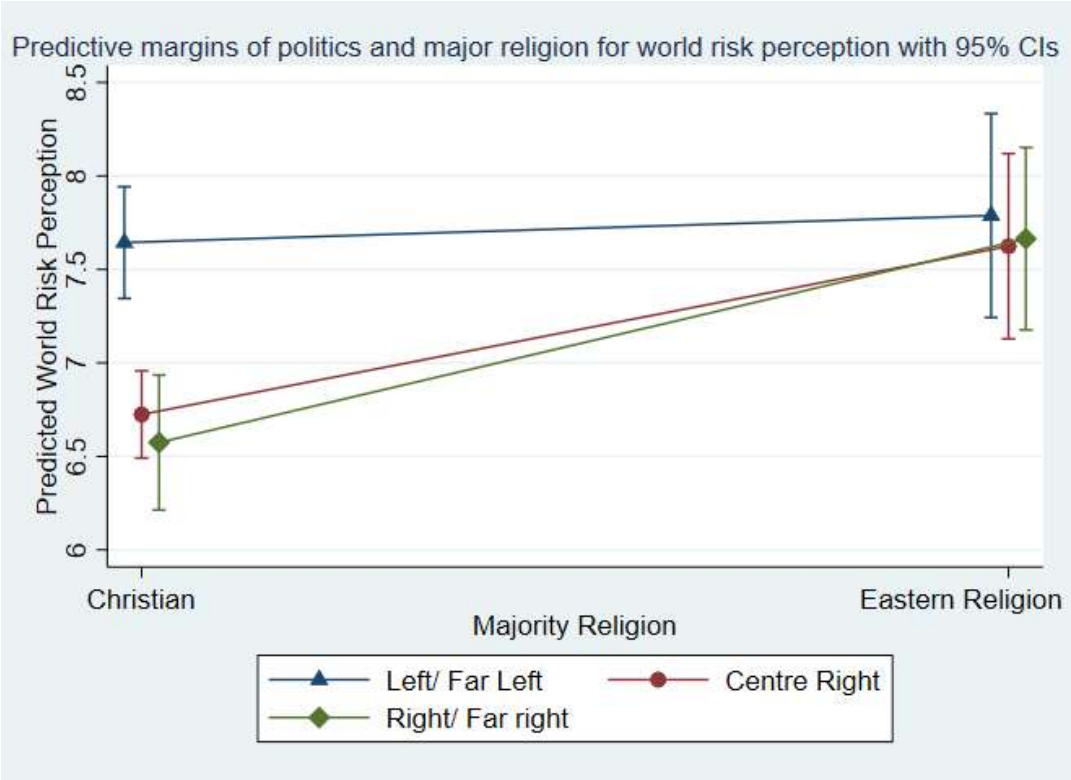
	M26 (Country Risk)	M26 (World Risk)	M27 (Country Risk)	M27 (World Risk)
Political Affiliation (Centre)				
Centre-left	.25 (.13)	.14 (.14)	-.86 (.75)	-.32 (.95)
Far left	.41* (.13)	.39* (.14)	-.05 (1.17)	.89 (1.02)
Centre-right	-.44* (.16)	-.53* (.17)	3.55* (1.14)	3.68* (1.25)
Far right	-.56* (.22)	-.68* (.21)	2.27* (3.10)	5.30 (3.38)
Refused/ didn't vote	-.07 (.12)	-.12 (.12)	.69 (.72)	1.41 (.90)
Major Religion				
Eastern Religion	.42 (.25)	.23 (.27)	.53 (.26)	.38 (.25)
GDP per capita (log)	.02 (.12)	.20 (.14)	.06 (.14)	.28* (.14)
Political Affiliation# Major Religion				
Centre-left # Eastern Religion	-.28 (.16)	-.21 (.21)		
Far left # Eastern Religion	-.02 (.20)	-.09 (.17)		
Centre-right # Eastern Religion	.75* (.20)	.67* (.23)		
Far right # Eastern Religion	.63* (.22)	.86* (.25)		
Refused/ didn't vote # Eastern Religion	.11 (.14)	.24 (.20)		
Political Affiliation# GDP				
Centre-left			.10 (.08)	.04 (.10)
Left/ Far left			.04 (.11)	-.05 (.10)
Centre-right			-.36* (.11)	-.38* (.12)
Right/ Far right			-.25 (.28)	-.55 (.31)
Refused/ didn't vote			-.07 (.08)	-.14 (.09)
Constant	5.26* (.95)	3.77* (1.19)	4.80* (1.19)	2.86 (1.24)
Var (Political Affiliation)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Var (Constant)	.23 (.07)	.17 (.04)	.23 (.06)	.16 (.04)
Var (Residual)	4.73 (.25)	4.91 (.29)	4.73 (.25)	4.91 (.29)
Observations (Countries)	34,305 (28)	34,353 (28)	34,305 (28)	34,353 (28)
ICC	.05	.03	.05	.03
Snijders/Bosker R-squared Level 1	.05	.07	.05	.07
Snijders/Bosker R-squared Level 2	.27	.51	.26	.52
AIC	127927.1	129099	127942.3	129102.7
BIC	128315.5	129487.4	128330.7	129491.2

**<0.05 P-value*
Controls include all individual-level variables from M21 (Table 6.1)

Political Affiliation and Majority Religion

Model 26 shows the results for the cross-level interaction between individual political affiliation and country majority religion. The results indicate an asymmetric effect for political affiliation in countries of with different majority religions, observable in figure 6.4 below. In Christian countries, centre-right and right/far right affiliated individuals are shown to have significantly lower risk perception than similarly politically affiliated individuals in Eastern Religious countries. Further, centre-right and right-wing individuals have close to 1-point lower risk perception than left wing individuals in Christian countries on the 11-point scale. In contrast, in countries with an Eastern Religion as its majority religion, climate change risk perception does not differ significantly by political affiliation.

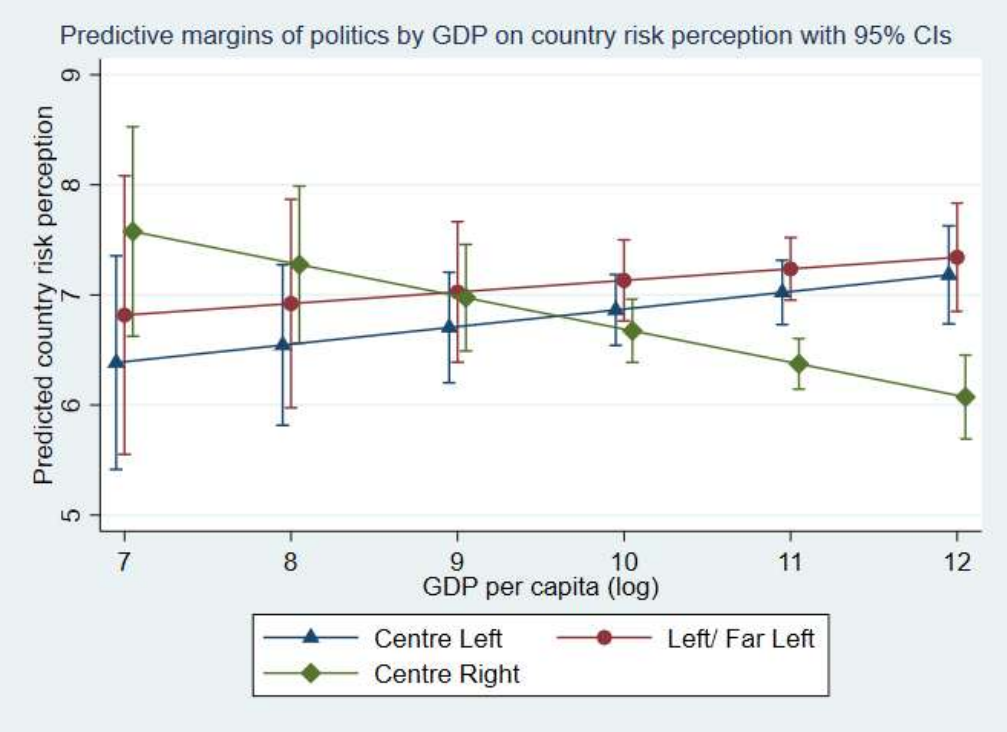
Figure 6.4 Predicted estimates for country risk perception by political affiliation category in Christian and Eastern Religious Majority countries (M26)



Political Affiliation and GDP

The results for M27 show a second cross-level interaction between political affiliation and GDP per capita (log). The results indicate that in richer countries, the effect of political affiliation is most apparent, with a larger gap between centre-left and left/far left parties compared to centre-right parties. In the wealthiest countries, centre-right affiliated individuals have just over 1-point lower country and world risk perception than centre-left and left/far left affiliated individuals on the 11-point scale, while differences are not statistically significant in poorer countries. Furthermore, the slope for centre-right affiliated individuals observable in figure 6.5 indicates a potential declining trend for said individuals the wealthier a country is, with the confidence intervals showing that centre-right individuals in the wealthiest countries have significantly lower risk perception than those in the poorest countries. The linear trend across countries based on wealth cannot be confirmed due to the overlapping confidence intervals in countries closer to an average GDP, but the differences between the two extremes of wealth are significant, with a difference of around 1.5 points.

Figure 6.5 Predicted estimates for political affiliation categories by GDP per capita on country risk perception (M27)



6.2.4 Control models

Table 6.7 Random intercept models for politics and postmaterialism with added control variables

	CR (M28)	WR (M28)	CR (M29)	WR (M29)	CR (M30)**	WR (M30)**
Political Affiliation (Centre)						
Centre-left	.25 (.13)	.14 (.14)	-.83 (.72)	-.31 (.95)	.21 (.13)	.15 (.13)
Far left	.41* (.13)	.38* (.14)	.05 (1.20)	.98 (1.04)	.41* (.11)	.40* (.12)
Centre-right	-.44* (.16)	-.52* (.17)	3.66* (1.16)	3.70* (1.26)	-.26 (.15)	-.34* (.15)
Far right	-.56* (.21)	-.68* (.21)	2.26 (3.11)	5.30 (3.44)	-.40* (.19)	-.45* (.21)
Refused/ didn't vote	-.07 (.12)	-.13 (.12)	.71 (.72)	1.39 (.90)	-.03 (.10)	-.05 (.10)
Major Religion (Christianity)						
Eastern Religion	.72* (.27)	.89* (.25)	.46 (.26)	.53 (.35)	.12 (.27)	.48 (.26)
Region (West)						
East	-.43 (.34)	-.45 (.39)	-.10 (.33)	-.12 (.40)		
GDP per capita (log)	.26 (.14)	.31 (.17)	.31* (.16)	.45* (.09)	.14 (.24)	.25 (.22)
Political Affiliation# Major Religion						
Centre-left # Eastern Religion	-.38* (.13)	-.43 (.10)				
Far left # Eastern Religion	-.13 (.24)	-.32 (.16)				
Centre-right # Eastern Religion	.65* (.13)	.44* (.17)				
Far right # Eastern Religion	.52* (.28)	.65* (.19)				
Refused/ didn't vote # Eastern Religion	.00	.00				
Political Affiliation# GDP						
Centre-left # GDP			.10 (.07)	.04 (.09)		
Far left # GDP			.04 (.11)	-.05 (.10)		
Centre-right # GDP			-.37* (.11)	-.39* (.12)		
Far right # GDP			-.25 (.28)	-.54 (.31)		
Refused/ didn't vote # GDP			-.07 (.08)	-.14 (.09)		
Proportion of Right Wing					-.01 (.01)	-.01 (.01)
Proportion of Postmaterialists					.01 (.01)	.03* (.01)
Emissions	-.14* (.04)	-.10* (.04)	-.13* (.04)	-.09* (.04)	-.06 (.03)	.01 (.03)
CRI	-.01* (.00)	-.00 (.00)	-.01* (.00)	-.00 (.00)	-.02 (.00)	-.02* (.01)
CCPI	-.03* (.01)	-.01 (.01)	-.03* (.01)	-.01 (.01)	-.00 (.01)	.02* (.01)
Constant	6.16* (1.37)	4.10* (1.64)	5.45 (1.27)	2.54 (1.70)	13.38* (2.43)	15.34* (3.24)
Var (Political Affiliation)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)		
Var (Constant)	.12 (.03)	.13 (.03)	.11 (.03)	.12 (.03)	.05 (.01)	.07 (.02)
Var (Residual)	4.78 (.24)	4.93 (.27)	4.78 (.24)	4.93 (.27)	4.75 (.25)	4.93 (.29)
Observations (Countries)	34,305 (28)	34,353 (28)	34,305 (28)	34,353 (28)	32,296 (27)	32,352 (27)
ICC	.02	.03	.02	.02	.01	.01
Snijders/Bosker R-squared Level 1	.07	.08	.07	.08	.08	.08
Snijders/Bosker R-squared Level 2	.61	.61	.63	.63	.81	.76
AIC	120944	122271.5	120957	122276.1	121010.4	122268.1
BIC	121379.9	122707.5	121392.9	122712.1	121463.1	122704.1

**<0.05 P-value*
Controls include all individual-level variables from M21 (Table 6.1)
***Inclusion of all aggregate variables removes China due to the lack of individual political affiliation responses.*

The models 28, 29 and 30 include several different control variables to test the validity of the models with main explanatory variables. Political affiliation and majority religion retain their significances in the cross-level interaction control model (M28), with larger coefficients for majority religion, .2 for country risk and .4 for world risk, in these models compared to (M26).

M28 also included a control for countries categorised as Western and Eastern as well as climate risk, policy performance and emissions per capita. This was to observe whether broad regional differences better explain the divide in the impact of political affiliation than religious majority. Religious majority retains its explanatory power while region in contrast indicates an insignificant and negative effect. M29 includes these controls for the cross-level interaction between political affiliation and GDP, indicating around .1 higher world risk perception compared with the main model (M27). Furthermore, the main coefficient for GDP is larger (.31) and statistically significant in the control model for country risk perception.

M30 includes all individual level variables alongside the same measures aggregated at the country level. These models have a far larger R^2 in comparison to the model with just individual level measures (M21), explaining 81% of the variation in country risk perception and 76% of the variation in world risk perception across 27 countries (excluding China due to the aggregated political affiliation variable), indicating that many of the individual level contributors are important for explaining differences between countries as well as within them the a large degree. A greater proportion of postmaterialists appears to indicate higher world risk perception (.03) within these countries, which is also true at the individual-level, where individuals who align with postmaterialist values indicate higher world risk perception. The proportion of right-wing individuals does not indicate any substantial effect on risk perception across the 28 countries, indicating that the effect of politics is better measured at the individual level.

6.3 Conclusion

The overall picture provided by the forms of analysis in this chapter enables several conclusions that expand knowledge of how political affiliation impacts climate change risk perception. Firstly, centre-right and right/far right affiliated individuals indicate lower risk perception than centre-affiliated individuals across the 28 countries, and left/far left have higher risk perception than centre-affiliated. Secondly, most of the variation across countries stems from differences between centre-right and right/far-right individuals in different countries. Further analysis of this variation through moderation analysis identified three contributors to the political right's lower climate change risk perception have been identified: Christianity, postmaterialism and

wealth, with attendance of religious services also having an impact on centre affiliated. Explanations for how each of these factors influence political affiliation are discussed further below.

6.3.1 Cross-national effects of politics

The random slopes models were illuminating for political affiliation. Left wing individuals are shown to have consistently higher country and world level risk perception, with very low variation across countries. This indicates that the contribution of this political ideology is a stable indicator of higher risk perception, and that individuals across countries who identify with left-affiliated parties are most likely to have similar beliefs when it comes to climate change. This latter finding is interesting as it opens questions relating to left-wing ideological homogeneity for other social issues. There is also an indication of increased risk perception for centre-left affiliated, though this is a less consistent trend.

Lower risk perception for centre-right and right/far right individuals was observed across different countries, though there is far higher variation across countries for these individuals. Higher levels of individualist value orientation are often cited as an explanation for lower risk perception for right-wing individuals, however, the variation indicates that country-specific contributors are vital to understanding why centre-right and right-wing individuals disagree on climate change to a higher degree than left and centre-left individuals. Differences across countries regarding the expressed positions of major political parties and media institutions on climate change may be important here, where open climate scepticism and the framing of the issue as 'contested' are commonplace in these spheres in countries including the US and Australia (O'Neill, 2013), wherein the centre-right are shown to have the lowest risk perception relative to other countries in the analysis. It is also probable that there are fewer ideological incentives to favour any particular perspective on the issue of climate change for right-wing affiliated individuals, or may be incentivized to ignore the threat i.e. anti-reflexivity (Dunlap, 2016), relative to the left, and that an exogenous factor such as media (Ophir, 2024) and political framing (Merkley & Stecula, 2020) may be important to driving differences in perspective when it comes to climate change.

6.3.2 Cross-national effects of postmaterialism

Postmaterialism has some impact upon climate change risk perception across the 28 countries, with a small positive effect for postmaterialists on world risk perception compared to materialist individuals. Inglehart and Abrahamson (1995) expected postmaterialism to align more closely with environmentalism than materialism, and these results concur with this conclusion. Knight (2016) also indicated that global climate change risk was associated with national wealth in alignment with the postmaterial, which was confirmed in the last chapter. The commonality between individual-level postmaterialism and aggregate level GDP per capita is present in this research, with world risk perception being impacted by both, while country level risk perception is not.

The proposed two worlds of environmentalism (Dunlap & York, 2008) were not evident in this research, with country-level risk perception relatively consistent across wealth and postmaterial categories. However, the proposed position of world risk perception as an issue more aligned with the perceptions of wealthier, postmaterialist individuals does appear to be correct, albeit with small effect sizes for both GDP per capita and postmaterialism.

6.3.2 Politics and Postmaterialism

The level-1 random intercept models included an interaction term for politics and postmaterialism. Literature has emphasised the relationship between politics and postmaterialism, with particular focus on divides between political ideologies; Norris and Inglehart (2019) note that postmaterialists tend to be more represented by left-affiliated individuals, with a strong correlation between liberal values and postmaterialism. However, it is important to explore the potential for divergences amongst postmaterialists of differing political perspectives. The interaction between politics and postmaterialism indicates differences between individuals in different political ideological categories may be partly explained by adherence to these particular value systems. While left-wing and right-wing affiliated materialists' climate change risk perception does not vary significantly across the 28 countries, there is a substantial difference between left-wing affiliated postmaterialists and right-wing affiliated postmaterialists.

The lower risk perception amongst right-wing affiliated postmaterialists and those who are left affiliated may indicate that the similarity in value systems does not contribute to a corresponding consistency in climate change risk perception[20]. This highlights that the established differences across political ideologies regarding climate change risk perception are somewhat dependent upon the differences between individuals who have the same priorities on the postmaterialist index, from a cross-national perspective. These individuals both place 'protect freedom of speech' and 'giving people more say in the government decisions' as their top priorities on the index, and as such place importance on issues of individual freedoms and democratic input. This coincides with the contemporary discourse amongst the so-called 'populist right', which places emphasis on unconstrained freedom of expression across many countries (Scott-Baumann & Perfect, 2021; Schultz, 2024; Jones, 2020).

The development of what Norris and Inglehart (2019) somewhat oxymoronically label 'authoritarian populism' may help to explain this divide amongst apparently populist individuals of differing political ideologies when it comes to climate change. The growth of right/far-right parties utilising populist rhetoric has been present in both Europe and the US, but also globally, with figures such as Trump, Orban, Duterte, Bolsonaro, and Modi being examples of such leaders from the 28 countries studied. Many of these leaders have voiced apathy and/or denialism towards anthropogenic climate change, which could be an example of the backlash that Norris and Inglehart (2019) have noted. This indicates that the right-wing backlash against postmaterialist's emphasis on environmentalism, has nonetheless primarily emerged amongst those individuals on the right who coincide most closely with postmaterialist value priorities identified in the 4-point index. Therefore, the differences in risk perception are paradoxically explained by opposing political ideologies that appear to coincide on issues of individual freedom and democratic representation.

Savage (1985) identifies 3 core contributors to the split between left and right postmaterialists in Europe, with higher religious attendance, lower levels of education and party identification.

[20] It may also indicate the inadequacy of the 4-point index of postmaterialism, with the expanded 12-point index being explored in the limitations section of the following discussion chapter.

Ibid also indicated that this may raise problems for the postmaterial index, with regards to how these groups can vary so substantially politically while maintaining the same value system. This research also adds to these questions. These are also identified as core contributors to the conservative white male effect in the USA, indicating there may be substantial cross-over between these two phenomena (McCright & Dunlap, 2011). This effect proves to have international influence, with the gender effect still being present across countries, though race was not controlled for. Therefore, this research supplements prior arguments relating to sociodemographic indictors of lower climate risk perception, through explanation of ideological and value-based contributors.

6.3.3 Politics and Attendance

The results for political affiliation and attendance of religious services indicate a trend that may reflect a similar effect to those identified in the USA within the 3-country analysis. In this case, Democrats (the centre/centre-left party in the US) were indicated substantially varying risk perception depending upon their attendance of religious services; democrats who never attend religious services have higher risk perception than those who attend regularly. The interaction effect across the 28 countries indicates a similar effect for centre parties, where those who attend regularly have lower risk perception than those who don't attend.

This indicates that the proposed conservative effects of religiosity are present in multiple countries, wherein more religious, centre-to-left, individuals indicate risk perception more in-line with those centre-right and right affiliated individuals whose lower risk perception appears to be primarily of function of their conservative politics, with no indication of an interaction between attendance and politics in their case in all but a few countries. Therefore, for those individuals who may not lean conservative politically in general may nonetheless align with conservative perspectives on climate change where higher degrees of religiosity are present. This finding emphasises the effect identified in the USA may not be unique and could help explain part of the variation within political affiliation categories.

6.3.4 Politics and Majority Religion

This section expanded on the analysis of religion's effect on climate change risk perception. The results indicate a substantial difference between Christian and Eastern religion majorities in

terms of how politics influences risk perception. There are substantial differences between political ideologies in Christian countries, with left and centre-left affiliated individuals indicating higher risk perception than right and centre-right affiliated individuals. Meanwhile, Eastern religion majority countries have similar risk perception across political affiliation categories, with similar levels to the left and centre-left in Christian countries, indicating that the right and centre-right in Christian countries as those who differ from the norm, coinciding with prior literature (Lujala et al. 2015; Tranter & Booth, 2015).

This indicates that developing a further understanding of right-wing political ideology in Christian countries may help identify a causal mechanism for ideology leading to lower climate change risk perception. Literature pertaining to the aversion of conservative ideology to climate change is substantial, with higher levels of individual religiosity and SES amongst these groups as identifiers of scepticism to climate change and communication. However, how majority religion interacts with this is less understood. This was partly explored in the theory of religion section, with Christianity forwarded as a highly anthropocentric religion which prescribes higher amounts of individual agency to its adherents.

The control for region indicated that majority religion provides a better explanation for this phenomenon, however, the cross over between Western countries and Christianity majorities on the one hand, and Eastern and Eastern Religion majorities on the other, is still substantial. McCright and Dunlap (2011) emphasise this, with diffusion of climate scepticism into Anglo nations being attributed to “conservative think tanks that promote free-market conservatism”. While this likely plays a significant role, this research forwards a possible contribution from institutions similarly orientated to Christianity, which may contribute to the development of particularly fertile ground for said free-market conservative ideology to take root. The absence of the same degree of climate scepticism in countries with Buddhist and Hindu majorities may similarly be attributable to the lack of influence for these free-market think tanks and media institutions too, however, this research proposes religion as a macro-institutional mechanism through which these political ideologies will or will not succeed in capturing large portions of the population of a given country.

6.3.5 Politics and Wealth

GDP per capita also offers further explanation for the variation amongst centre-right affiliated individuals across the 28 countries. The cross-level interaction indicates that centre-right individuals in wealthier countries have lower risk perception than those in less wealth countries. This also highlights that the difference between individuals of varying political ideology in less wealthy countries do not appear to be significant. Rather, the difference between political categories appears to increase by per capita wealth.

This may be a function of conservative ideology in wealthier countries, where discourse surrounding climate change may be viewed as a threat to contemporary modes of life. For example, the energy transition from fossil fuels towards renewable energy is often viewed as a potentially deleterious, as well as unnecessary, economic investment. Therefore, this could be an example of generally higher scepticism amongst conservative individuals in wealthy countries, or it may be an example of motivated reasoning, wherein the potential economic drawbacks of an energy transition are seen as unacceptable, with climate change being undermined as an issue of importance amongst this group. This would also explain the difference with conservatives in less wealthy countries, where the historical ties between fossil fuels and development may not be as deep rooted in the public consciousness.

6.3.6 Mechanisms for political affiliation's effect on climate change risk perception

Conservativism does appear to be an important predictor of lower risk perception relative to other political ideologies, with supplementary effects and possible causal mechanisms being identified from other sociological factors: religious attendance, Christian majorities, high country wealth, and postmaterialist values. This more specific argument focused on climate change is expanded upon in the literature to more broadly explain the reactionary shift amongst right-wing political movements across the Global North, with status threat proposed as a mechanism explaining its occurrence (Parker & Lavine, 2024). It is proposed that processes related to globalisation effectively explain the rise of political movements on the political 'extremes', and interpretations of climate change as a disruptive, global issue may offer an example of an issue wherein this status anxiety and anti-reflexive, motivated reasoning, which has the effect of suppressing risk perception, is particularly prevalent amongst those who live in

the Global North and hegemonic Christian West. It is reasonable to expect that conservative ideology corresponds most strongly with resistance to a substantial change in their way of life and that this explains their generally lower risk perception.

7. Discussion

The purpose of this research has been to expand upon sociological and social-psychological understandings of climate change risk perception, particularly in relation to political ideology, postmaterial values and religiosity. This proceeds sequentially, beginning with the 3-country analysis, then the multilevel modelling chapters focusing on religion, followed by politics and postmaterialism. This chapter will discuss the main findings of the research in reference to relevant literature, with the second section focused on religion having limited literature to refer to, providing space to explore implications of the research and how well it corresponds with the theory section where relevant literature was explored extensively.

7.1 Case study analysis of Finland, Japan and the USA

7.1.1 Politics, Religious Affiliation and Attendance of Religious Services across Finland, Japan and the US

The first empirical chapter engaged with individual level contributors to risk perception in Finland, Japan and the United States, exploring the influence of politics, postmaterialism and religion in specific contexts. The analysis indicates that contributors to risk perception vary significantly across countries. The USA has been analysed most extensively prior to this research and is an established example of the influence of political affiliation and ideology upon climate change risk perception. In Finland and Japan, politics and religion do not contribute to risk perception to the same extent. The US also indicates a role for attendance of religious services, where individuals with highest levels of attendance in American societies have substantially lower risk perception than those who don't. Furthermore, protestants and other Christians indicate lower risk perception too. These results indicate that these ideological factors play a large role in explaining the differences in climate change risk perception across the US. These factors are discussed in detail in the section on moderation below.

Finland offered an interesting alternative case study to the USA. In maintaining a Christian majority, with affiliation to the Evangelical Lutheran religion still being high, the countries share a level of surface level similarity. However, processes of secularisation have been quite distinct across the two countries, with education and institutional development in Finland being more substantively distanced from its historical religious roots (Taira, 2017; Aarnia-Linnavuori, 2013).

Neither attendance of religious services nor religious affiliation indicate any significant impact on risk perception in Finland. This indicates important differences in religiosity across countries, with factors such as levels of religious affiliation and attendance in this case providing evidence of the uneven development of these factors across these two countries and implying that historical and cultural development are significant drivers of asymmetric religious ideology and practice.

Political affiliation does indicate a somewhat similar trend with more right-wing parties indicating lower risk perception, although the effects in Finland are notably smaller than the USA. This partly captures the contrast between European countries and the US, with the former generally less exposed to contentious political framing (Tavares et al. 2020) and political groups experiencing minor differences when exposed to evidence framed in various ways (Stefkovics & Zenovitz, 2023). Nonetheless, the growth of the right-wing populist party True-Finns in Finland is an example of the populist wave present across much of Europe and the world. True Finns represent issues common across the populist right, including anti-immigration, Euroscepticism and indeed opposition to ambitious net zero targets. While the True-Finns represent a small portion of Finland's electorate, this finding coincides with evidence that right-wing populist politics generally attracts individuals with a greater aversion to the issue climate change and some aspects of environmentalism more broadly (Kulin & Sevä, 2024). However, as will be shown in section 7.3, there is a degree of variation across countries in terms of how right-wing politics effects risk perception (ibid).

Japan was chosen due to its distinctive character as a Buddhist/Shinto majority country and the potential impact that this distinct historical and cultural heritage may have on contemporary climate change attitudes. This was evidenced somewhat by the positive effect of attendance of religious services on country-level risk perception, in contrast to the negative coefficients in Finland and the US[21], indicating that the effect of practice of these religions has a varied impact on the perceived climate threat than Christianity. The comparison between Finland and Japan

[21] Coefficients for attendance of religious services were negative in both countries but only statistically significant in the US.

as both relatively secularised countries is perhaps most interesting in this regard, where religion has increasingly become an issue of cultural significance, while its impact on individual attitudes has receded, as noted in the country profiles. This emphasises that while the impact of religion on individuals across these societies may be small, the cultural, historical and institutional contributions to varied religious doctrines in the two countries appear to maintain some influence and may explain the small variations present within the two countries. This consideration had a considerable impact upon the theory of religion utilised in the following analysis, where the aggregate effects religiosity could be accounted for.

The effect of politics in Japan also contrasts with Finland and the USA, with only the social democratic party affiliated individuals indicating higher risk perception. This was expected due to the nature of Japanese politics and the higher levels of politicisation in the US and Europe. As outlined in the country profiles, Japanese politics continues to be dominated by bureaucratic elites, with a close relationship to political figures in the dominant LDP and industry, forming an iron triangle between the three institutions (Moe, 2012). Climate change is an issue that represents the function of this system of policymaking, due to its scientific technicality and its broad implications for a multitude of societal institutions (Takao, 2011; Ohta & Barrett, 2023; cf. Kameyama, 2021). Therefore, while individual attitudes are shown to vary significantly across Japan, political affiliation has less relevance in both guiding Japanese perceptions, almost definitionally since climate change is very rarely the subject of political controversy in the country.

Populism is also less prevalent in Japan, with public discontent not manifesting in drastic changes in political communication as it has in the USA in particular, though also somewhat in Finland. Climate change has not been subject to politicisation from media (Sampei & Aoyagi-Usui, 2009) or political elites in the country, with some minor concerns regarding Prime Minister Kishida's overall commitment to decarbonisation (Patrick, 2021). These factors likely supplement its standing as an issue of primarily technocratic relevance, at least with regards to the solutions, for Japanese citizens. While this system hasn't emerged as a particularly effective method of climate change policy making, it likely offers an explanation for lower variation in

climate change risk perception amongst Japanese individuals in comparison to those in Finland and the USA to some extent.

7.1.2 Moderation of Political Affiliation across Finland, Japan and the USA

Through analysis of the moderating effects of religion upon political affiliation, trends were identified across the 3 countries which emphasise the nuances present in the relationship between religion and politics. In line with Arbuckle (2017), this research shows the moderating effect of religious affiliation on risk perception across different political groups. In the US, non-religious Democrats have higher risk perception than Protestant Democrats, whereas for Republicans and independents there is little indication of a difference within these political groups. Therefore, while Democrats tend to have the highest risk perception amongst the general population, varying religious affiliation amongst individuals within the party highlight substantial variation in how climate change risk is perceived, with Protestant Democrats being more in line with those who identify as Independent, and closer to Republicans, who maintain the lowest risk perception in the US population.

This effect extends beyond religious affiliation to attendance of religious services too. Once again, Democrats who never attend church have high risk perception, while those who attend most regularly (more than once a month) have risk perception in line with Republicans, who do not vary substantially depending upon attendance. In fact, this attendance effect is greater between Democrats than the differences underlined for religious affiliation, with around 2.5 lower risk perception on the 11-point scale. This provides evidence that while professed affiliation to Christianity in the USA, and therefore a level of expected ideological commitment to that religion, is vitally important to understanding the differences within the US Democratic party, the consistency of religious practice may be even more so when it comes to understanding the nature of the relationship between religiosity and climate risk perception.

The analysis also identified postmaterialism as another mechanism through which political groups in the US vary on the issue of climate change. Those who prioritise what Inglehart (1971) proposes to be postmaterialist values i.e. freedom of speech and giving people more say in government, vary significantly across political parties, while those who prioritise materialist values i.e. maintaining order and fighting inflation, do not. This finding considerably impacts

conceptualisations of conservative scepticism towards climate change in the United States, indicating that the significant variation observed between Democrats and Republicans is correlated with these broad cultural priorities. This finding guided the 3rd analysis chapter, which extends the analysis of postmaterial values and political affiliation to cover the 28-country sample. However, the United States offers an interesting case-study of the broader effects of politics and prioritsation of freedom of speech and giving people more say in the government.

While this finding does have implications for the veracity of the postmaterialist hypothesis[22], the relationship of these priorities, political affiliation, and climate change risk perception has clear relevance in the contemporary American political context, with issues of free speech and democratic accountability being at the forefront of the development and increased prevalence of populism within the US. Donald Trump and the MAGA[23] movement openly voice scepticism for climate change, to a greater degree than traditional Republican politicians, while also emphasising its populist credentials through the glorification of free speech and governing for the people[24]. Evidence from the US explicitly links the growth of Trumpian populism in the US to climate change, with the climate advocates and expert framed as elite actors "set on undermining the will of the people" (Fiorino, 2022). This context clearly identifies the link between climate change, politics and postmaterial priorities. This guided the 3rd analysis chapter, which fully developed upon these relationships and are discussed below.

The case of moderation in Finland indicates a contrasting relationship to the USA, wherein those affiliated with centre-right/right wing parties are most affected by religious attendance; True Finns and National Coalition voters who attend more than once a month have far lower risk perception than those who never attend. On the other hand, those affiliated with the centre-left Social Democratic Party do not vary in their risk perception according to attendance of religious services. There are several possible contributors to the contrasts between Finland and the US. The influence of religion on the cultural, social, and political spheres in the US has

[22] Expanded upon in section 7.3.2
[23] Make America Great Again
[24] Expanded upon in section 7.3.2

likely limited the degree to which the secularisation of various areas of American society has developed, which is expected to limit the degree to which climate change risk resonates with the US public. This may have a dual effect on the parties on each side of the US political spectrum. Firstly, the more conservative practice of Protestantism in the US is expected to be the reason for the divide amongst religious and non-religious democrats (Hollinger, 2022). In this case, individual religiosity may lead to lower risk perception, despite the move towards more institutional secularisation, primarily in regions where democrats have had influence, including the democratic party itself.

On the other hand, the explicit ideological preference within generally far right and conservative religious movements for anti-environmentalism in the US is based upon the perceived anticapitalism and 'paganistic' origins of environmentalism as well as, importantly, Christian stewardship and dominion theology. The individuals captured by religious movements directly are likely a minority. However, the entanglement of the Republican party with the evangelical denominations prominent in the south could also explain the divides in climate change risk perception in the US, even amongst non-religious republicans, as evidenced by the cultural importance of issues included abortion which have historically been fought along religious lines. In this sense, the notable lack of difference between religious and non-religious Republicans on the issue of climate change risk perception may be explained by the historical capture of the Republican party by ideological prescripts closely related to the practice of conservative Christianity (Claassen, 2015), acting as a structural influence upon individuals, and diluting the influence of individual religious affiliation in the country.

Meanwhile in Finland, where the separation between politics and religion in the public sphere is more extensive, individual religious practice is observed as a prevalent influence upon more right-wing individuals, where the structural influence of religiosity on political parties and movements may be less extensive. Therefore, the combined effect of both conservative politics and conservative religion (specifically Christianity) is here more aptly captured by the supplementary effects of the two conservative ideologies taken together, with devoutly religious, right-wing affiliated individuals indicating substantially lower risk perception than the general population, and, importantly, both secular right-wing voters and religious left-wing

voters. This emphasises the smaller role that religion plays across Finnish society in general, relative to the United States.

Moderating effects for in Japan religious attendance and affiliation were small, with evidence that left-wing voters who attend services more often indicate lower risk perception. However, these effects were only present in minor parties (Communist and Social Democratic) and as such aren't representative of much of the Japanese electorate. Therefore, the case of Japan indicates that individual-level religiosity and politics play only a minor role in the differences in climate change risk perception across the Japanese population. The larger impact of the attitudinal variables in Japan included in the models such as personal and collective efficacy, and postmaterialism, may be indicative of a lower propensity towards partisanship and in-group bias on Japanese individuals, particularly compared to the US but also relative to Finland too. It also coincides with the expectations from the country-profiles regarding the strength of such measures in Japan (Picken, 1994).

Japan and Finland offered substantially different case studies to the USA, as outlined in their country profiles. Attitudinal measures offer some explanation for variation in risk perception in Japan, with postmaterialism, and both efficacy measures providing the bulk of the explanatory power for these models. For Finland, age is a significant contributor to differences across the population, with a large difference between younger and older respondents – an individual who is 33 years older than another is expected to score around 1 lower on the risk perception scale. The research emphasised that the dominance of focus within the sociological literature upon Western Europe and the United States may have contributed to a relatively myopic view on contributors to risk perception, with a particular weakness in the model for Japan.

7.1.3 Lessons for the next analyses

This analysis provided important lessons that guided the following two analysis chapters. The 2nd analysis engaged with a theory of religion, which was partly guided by the differences identified across Finland, Japan and the USA. The evidence indicates substantial differences between these countries meaning that consistency across the 28 countries was not expected. However, the evidence regarding the moderating impact of attendance of religious services on left/centre affiliated in the USA, and the right affiliated in Finland provided an indication that

attendance may play a role in lowering risk perception amongst political ideologies in these Christian majority countries. Meanwhile, the small positive effect for attendance, and positive moderating effect on left wing parties, in Japan also highlights this effect can vary, and that this may be due to the differences in religious ideology and practice in Japan, with the differences between Christianity and Buddhism offering a possible explanation for this contrasting effect on risk perception. This also helped orientate the country-level analysis of the 28 countries, with majority religions offering another potential mechanism through which religious ideologies may influence climate change risk perception. These lessons were vital for informing the subsequent analyses using pooled data.

The identified moderating effect of Christianity on democrats in the USA (Arbuckle, 2017) was shown to extend to religious affiliation too (Arbuckle, 2017). However, the lack of effect in Finland and Japan indicated that this may be highly country dependent and not suitable for the broader 28-country analysis. Therefore, this finding didn't guide the forthcoming analyses. Nonetheless, it was expected that religious affiliation may influence risk perception across the 28 countries, due to the ideological variation between religions. As this was not identified in the 28-country analysis, an exploration of the unique relationship between risk perception and religion in the US is developed below. Religious attendance was expected to generally negatively impact climate change risk perception across the 28 countries, and this was partly shaped by the large number of Christian majority countries. Meanwhile, countries with majority Eastern Religions were expected to indicate a small positive effect. The results generally aligned with this expectation and are explored further below.

The results for political affiliation indicated trends identified in the literature regarding right wing politics in Europe and the US having a generally negative impact on climate change risk perception, with these effects being particularly large in the US. Meanwhile, more left-wing parties in Japan have higher risk perception showing this identified positive effect for left-wing politics extends outside of Europe in this case. These results provided expectations that risk perception on the left would generally be higher in most countries, while the right would be generally lower, with this effect being particularly pronounced. Meanwhile, the positive effect of postmaterialism in Japan indicated that the proposed variation in cultural values was a

relevant point of analysis across the 28 countries. The 3rd empirical analysis was guided by these findings as well as the evidence from the literature.

There are noted trade-offs when utilising either method – the in-depth country analysis utilised in Chapter 4 and the pooled multilevel data analysis used in Chapters 5 and 6. The degree of precision regarding each individual country is greater in Chapter 4. For example, the unique moderation effects of religion and postmaterialism on politics in the USA would've been more difficult to identify in multilevel analysis. However, it was considered important to move towards pooled data analysis for the subsequent two chapters due to the importance of analysing country-level differences, which were reflected in the results and discussed below, and for providing greater understanding of global climate risk perception. The global nature of the issue of climate change necessitates empirical research pertaining to individuals from differing backgrounds and societies, with this method allowing for the understanding of commonalities that may be harnessed in international cooperative efforts.

7.2 Theory of Religion and cross-country analysis of climate change risk perception

The 2nd empirical chapter was purposed with both an extensive analysis of contributors to climate change risk perception and the operationalisation of the theory of religion outlined just prior to the analysis. While the theory engaged with concepts not directly measurable in the multivariate linear regression and multilevel models, predicted effects of the potential contributors outlined in the theory were provided to test the veracity of the theoretical expectations. The expected effects indicated within the theory were generally consistent with those found in the empirical analysis, though the analysis has indicated many areas where expectations require further tuning in line with the evidence.

7.2.1 The impact of individual-level religious affiliation and attendance of religious services

Beginning with individual level contributors, individual religious affiliation did not indicate any strong relationship with risk perception across the 28 countries[25]. The random slopes models indicate that variation across countries was also generally low. Therefore, it is reasonable to argue that individual-level religious affiliation is not particularly impactful on climate change

[25] The relationship between religious affiliation and GDP is explored below.

risk perception across the countries, with only a few examples of substantial influence. This went against expectations from the theory section, where individual religious affiliation was expected to vary significantly yet still maintain at least a small influence in many countries. Christianity was expected to negatively influence risk perception in some countries similarly to the United States in the 1st analysis, however, in most cases religious affiliation remained at most a small factor in driving risk perception. This indicates that Christianity in United States may represent a special case, with the influence of religion not observed in Finland or Japan in the 3-country analysis corresponding to a lack of substantial effects on the cross-national level. This could emerge due to a peculiarity in the nature of Christianity in the US, and the lower degree of secularisation present in the country, relative to other post-industrial countries, with greater degrees of fundamentalist belief and suspicion of science (Upenieks et al. 2021; Oreskes & Conway, 2022).

The identified relationship between politics and religion may offer some explanation too. This relationship will be developed in more depth below in section 7.3.5. However, it is important to draw on here due to the somewhat anomalous relationship between individual religiosity and climate change risk perception in the United States. The greater role for conservative ideology within the US, including within Christianity itself, relative to other high-income countries, and the strength of Christianity in both public and private spheres, points towards a mutually reinforcing relationship between conservative religion and politics (Froese, 2014; Glass, 2018). These factors likely influence higher levels of ideological homogeneity across these forms of individual affiliation. This could explain the lack of variation within the Republican party based on religious affiliation. Meanwhile, the strength of Christian conservatism across US society more generally may explain the distinctions between Christian and non-religious Democrats, where conservative religiosity appears at odds with the liberal politics characteristic of the Democratic party.

The literature review developed on the notion of religion shaping politics, but also the possibility of politics shaping religiosity in the United States (Oreskes & Conway, 2022), evidenced by the historical development of the anti-abortion ‘pro-life’ movement. It is reasonable to argue this unique effect of Christianity may emerge from a similar mechanism.

Indeed, Margolis (2018) emphasises the role of partisanship in the US as a driver of religiosity, and Smolin (2018) highlights the tendency across the US for an individuals' politics taking preeminence over religion, and for the former to increasingly function like the latter.

In the case of risk perception, the fact that political affiliation is an observed factor impacting climate change risk perception across many countries, while religion is generally a marginal influence, may imply this directionality. This is difficult to determine and would require further analysis pertaining to causal mechanisms regarding the influence of religion and politics upon risk perception. It is also reasonable that the ongoing institutional influence of Christianity, identified as a mechanism across countries in this analysis, exerts a level of influence on individual American's perceptions (Froese, 2014), and this may be important for explaining the differences between Christian and non-religious Democrats, which cannot be attributed to the effect of politics upon religion to the same degree. Overall, however, the close relationship between religion and politics, particularly the Republican party, as well as the extreme partisanship characterising the US climate change discourse, offers the best explanation for the unique effect of Christianity on risk perception in the United States.

Returning to the 28-country analysis, the limited influence of religion amongst other socio-demographic variables was somewhat expected, due to the primacy of cognitive, effective, social and cultural influences as both contributors to climate change risk perception and mediators of socio-demographic measures (Van der Linden, 2017). Another potential explanation for the weak explanatory power relates to the countries analysed, with many being high-income countries that have overseen a substantial secularisation throughout the last few centuries. As noted throughout the theory, secular countries tend to be higher income, with the indication that the need for religion declines with material wellbeing, amongst other factors related to wealth (Baar, 2021; Storm, 2017; Barro & McCleary, 2003). The mechanisms through which this can impact different countries were explored more extensively through the analysis of country wealth and religious affiliation and are discussed below.

It is also probable that due to the high variation across countries in terms of how a given religion is taught and practiced, cross-national comparisons based on broad measures such as

risk perception may be less useful than individual country studies from both quantitative and qualitative perspectives. It is difficult here to outline the influence of religion across each of the 28 countries individually, where literature has found variation across religious groups in specific countries for various climate attitudinal measures (Morrison, 2015). Therefore, this research should be considered alongside the more focused examples in the literature.

The conceptual differences between the environmental measures analysed may engage with different mechanisms through which religiosity can influence individuals' perceptions and attitudes. For example, Zimo and Nigus' (2021) research indicated a positive effect for religiosity upon agreement with the statement that environmental protection should be prioritised over economic growth. Agreement with this statement could be analysed based upon a similar typology of religion to that proposed in the theory section. However, it clearly diverges conceptually from climate change risk perception; where risk perception relates to an assessment of the dangers of a particular environmental hazard, high risk perception does not necessarily map on to pro-environmental perceptions, despite being strongly correlated. Therefore, the conceptual differences in valuing the environmental as a matter of principle, which is prevalent across many religions, and perceived threat of this particular ecological phenomenon, may explain the varied impacts of religiosity and religious affiliation identified across this study and the literature.

Attendance of religious services on the other hand highlighted the importance of religious practice as a contributor to climate change risk perception. The mixed effects models and random slopes for attendance show a generally small, negative effect on risk perception across countries with a range around 2 points on the 11-point climate risk scale (.50 to -1.50 rounded). This negative effect was expected to be larger amongst Christian countries than Buddhist countries, based on theory as well as the indication from Japan in the 3-country analysis, and this potential relationship was made somewhat apparent in the analysis of random slopes for country risk perception with Taiwan, Japan, Korea and China ranked highest amongst the countries analysed in terms of risk perception based on attendance of religious services. However, Thailand resides second from bottom showing there is still significant variation between Buddhist majority countries in terms of the effect of religious attendance too.

Therefore, while the varying characteristics of religions, with an emphasis on individual practice rather than adherence, appear to play a role in differentiating individuals both within and between countries, these effects are a small factor overall.

The varying effects of attendance of religious services alongside the lack of effect for religious affiliation is interesting as it emphasises that while religious affiliation does not meaningfully influence climate risk perception across the general population in most countries, religiosity nonetheless does influence perceptions within the smaller portion of the population who attend services. This indicates that the character of individual religious belief may still be important, but remain dependent upon consistency of practice, which was emphasised as a possibility in the theory section. Further moderation analysis could enquire into the differences between similarly affiliated individuals based upon their religious attendance and enquire into the differences that varying degrees of religious practice incur upon the climate perceptions of these individuals. This form of analysis may be more effective with larger samples and/or incorporation of qualitative methods to analyse the underlying differences between religious individuals who attend services regularly compared to those who do not. This may help explain the identified role for attendance alongside the lack of role for individual affiliation.

7.2.2 The impact of majority religion, proportion of Christians, religious fundamentalism and GDP

The analysis of country-level predictors of religion was purposed with expanding the scope of the understanding of how religion influences climate change risk perception, with few studies attempting to explore these mechanisms in relation to environmental and climate attitudes. The rationale put forward in the theory section proposed the potential importance of religion as both a source of individual meaning and belief, as well as institutional influence, both historically and in contemporary society. The latter was considered most appropriately analysed through multilevel analysis with the focus on religious majorities and differences between countries regarding the ongoing influence of religion on governmental decision making and restrictions placed on the population.

Majority religion was analysed through the categorisation of Christian majority countries and countries with majorities of Eastern Religions (Buddhism and Hinduism). The results provided evidence of the importance of religion on climate change across these categories, with Eastern

Religion majority countries indicating substantially higher country risk perception. This result was expected according to the theory, with Buddhism and Hinduism's lower levels of anthropocentrism in comparison to Christianity being the expected mechanism through which Eastern Religions would generally tend towards greater receptivity to the threat of climate change. While Christianity was expected to provide a greater sense of agency to its adherents, signaled by the free will/determinism axis, which in turn may indicate higher risk perception, this relationship was considered less certain as a contributor to climate risk perception, and likely subordinate to the anthropocentrism axis. The agency dimension may help to explain the differences between country and world risk perception, however, which will be discussed below.

Protestant majority countries indicated differences between major Christian denominations for country risk perception and an even larger difference to Eastern Religions. Protestant countries indicated the lowest risk perception, with other Christian countries (Catholic and Orthodox) indicating slightly higher risk perception, and Eastern Religion majority countries indicating the highest. These results were also in-line with theoretical expectations, with the proposed mechanism of anthropocentrism as a primary determinant. Protestantism can be viewed as a religious ideology that establishes the dualism between man and nature in a particularly stark and fundamental sense. Weber's *Protestant Ethic* emphasised the religion's unique characteristics as one that enabled the advent of modern industrialised capitalism and, along similar lines, these unique characteristics were forwarded in the theory section as characteristics that may contribute to an increased aversion to the notion of anthropocentric ecological crises, such as climate change. While other Christian denominations share a somewhat similar level of dualism, as well as specific doctrines such as stewardship and dominion (reflected in the above results when Christian denominations are combined), the proposed effect of these theological prescriptions were most evident within the historical development and contemporary function of institutions in Western capitalist countries. While this result does not provide definitive proof of this relationship, it provides evidence that the influence of different religions upon macro-institutional development can produce ongoing

effects on the attitudes of different country's citizens in the contemporary setting, in this case climate change risk perception.

Percentage of Christians offered an alternative aggregate level measure, and the results indicate unique mechanisms in comparison to majority religion. For both country and world risk perception, having a greater number of Christians in a country leads to lower risk perception amongst the population. This exposes a slightly different mechanism to that shown by majority religion, as while institutional development corresponds to percentage of Christians in most cases, due to the likelihood that high Christian populations are persistent in countries based upon Christian morality and ethics, across history, it is does not capture institutional development those countries where Christian populations have grown substantially in recent history i.e. South Korea where the Christian population burgeoned post-war and even more so post-cold war (Connor, 2014). Therefore, this measure is more limited to, and indictive of, the role that Christianity plays in contemporary civil society, public discourse, and to an extent can be viewed, although cautiously due to the above reasons, from the perspective that those with lower Christian populations have essentially close to zero institutional influence from the religion, whereas most high Christian populations have throughout their history.

The aggregate level measures for fundamentalism did not coincide with the expectations developed in the theory, with no indication that government restriction upon religion or social hostility towards religious minorities meaningfully impact climate change risk perception. The first expectation that fundamentalism may act as a magnification of effects specific to each religion i.e. Christian fundamentalism may lead to a greater influence of the more anthropocentric aspects of this religion, was not confirmed through analysis. While this relationship may be observed in individual countries, with the USA being a case study for the influence of fundamentalist religiosity in politics and climate discourse, this was only implied through the individual-level measures including religious affiliation and attendance of religious services.

The second potential mechanism through which fundamentalism was expected to influence climate change risk perception was that the proliferation of authoritarian attitudes, practices

and structures may lead to a general aversion towards climate change and environmentalism across a population more broadly. The measures for country-level fundamentalism measures themselves were not perfectly suited to testing the theoretical expectations, as neither directly indicated the propensity for fundamentalist beliefs within a religion and were instead restricted to authoritarianism and social relations between groups. This will be explored more in the limitations section.

The expected influence of GDP per capita on religious affiliation noted in the theory section generally aligned with the results from the analysis. The results showed that religiously affiliated individuals generally report higher risk perception than non-religious individuals in low-income countries, and this is true for all major religions and denominations included in the analysis besides Judaism, where variation based on GDP does not appear to have much influence. In richer countries, non-religious individuals have substantially higher risk perception than non-religious individuals in poorer countries. The trend for religious individuals indicates a small, positive trend, though these differences were not statistically significant. Therefore, the expectation of a 'dual-edged effect' from religion noted in the theory section appears to be true, where the provision of a philosophical and epistemological framework by major religions incurs relatively stable climate change perceptions across countries regardless of wealth, while non-religious individuals appear to vary substantially, where the lack of a guiding framework may lead to vastly different perceptions dependent upon factors other than religion.

Non-religious individuals in high-income countries are likely to have more direct experience with the benefit of scientific advances as well as higher levels of advanced education and may trust the conclusions associated with this epistemological framework more than individuals who are less privileged, with the exposure to science across high- and low-income countries noted in the literature (Krugly-Smolska, 2007). Meanwhile, the lower variation amongst religious individuals may emerge due to a generally higher proclivity to scientific scepticism and lower scientific literacy (McPhetres & Zuckerman, 2018), perhaps influenced by the subscription to alternative epistemological frameworks. Nonetheless, the difference between non-religious individuals and religious individuals across wealthy countries is generally not significant. Furthermore, the control models show that religious individuals' risk perception is

higher in wealthy countries, compared to less wealthy countries, though the difference for non-religious individuals is still substantially larger. This adds nuance to past findings which identify a lack of religiosity as a general positive for environmental perceptions (Arli et al. 2023), with clear evidence that religion can also benefit climate change perceptions in less wealthy countries, compared to non-religious individuals in the same countries.

7.3 Cross-country analysis of political affiliation and postmaterialism

The final empirical chapter presented an in-depth analysis of the effects of politics and postmaterialism on climate change risk perception. This analysis primarily aimed to expand knowledge regarding the mechanisms underlying political affiliation's contribution to risk perception cross-nationally, with most literature focusing on one or a handful of countries. Across the 28 countries, right-wing politics is generally a contributor to lower risk perception, with substantial variation across countries. Mechanisms for the right-wing and centre-right political ideology were proposed throughout the analysis too. Namely, postmaterialism, Christian majorities, GDP per capita and religious attendance. These 4 factors were shown in the moderation analysis to meaningfully impact the risk perception of centre-right and sometimes right/far-right individuals. Further discussion regarding the contribution of these factors to the political right's lower risk perception highlighted how they may function as supplementary contributors or possible mechanisms to conservatism and its aversion to climate change as an issue are included after a more general discussion relating to right wing politics and climate change.

7.3.1 Conservative ideology and its aversion to climate change

Reasons for the general aversion of conservatives to the issue of climate change have been explored throughout the literature, with concurrence regarding higher levels of conservative ideology predicting lower climate change risk perception (Stanley et al. 2023). Some explanations have been drawn from integrated theories of personality used to explain political conservatism (Jost et al. 2003). Social Dominance Orientation (SDO) and right-wing authoritarianism predict lower environmental concern and willingness to act on climate change (Stanley et al. 2019), as well as climate change risk perception (Jylhä & Hellmer, 2020). SDO is a general attitudinal orientation, which captures the divide between egalitarian and hierarchical

social perspectives (Pratto et al. 1994), with a greater level of orientation towards the latter amongst conservatives. Higher levels of hierarchical SDO are likely to coincide with increased perceived status threat due to the fragility of maintaining the dominance of a smaller in-group, relative to more egalitarian perspectives (Parker & Lavine, 2024).

Stanley et al. (2023) explore this in relation to risk perception, emphasising the multifaceted nature of perceived climate-related threat, including economic and cultural well-being. Perceived threat from climate policy being higher amongst conservatives emphasises this asymmetrical threat perception. Ibid highlights variation in denialism where climate policy is framed as either at odds with free-market ideology or within a framework of economic growth from green technologies. This may be explained by motivated reasoning wherein ideological preferences take precedence over scientific evidence relating to climate change, and this also extends to maintenance of the social order. With motivated reasoning, reverse causality is a necessary consideration, with literature indicating that perceived threats (i.e. climate policy) may be utilised to justify issue preferences i.e. economic growth (Brandt & Bakker, 2022). This is a broader discussion than this research aims to develop upon, however. The relationship between the elements of SDO, status threat and the social factors associated with climate change, appears to be particularly relevant to the conservative perspective on climate change.

In terms of mechanisms shaping conservatives' perspective on climate change, there appears to be an important role played by various media sources in shaping individual perceptions too. Media was not included in the analysis due to data availability, however, offers another important mechanism through which political divisions relating to climate change have emerged, and through which the political right have developed scepticism across many countries (Ophir, 2024; Taddicken & Wolff, 2023) and remains relevant to this discussion. Furthermore, much of this research identifies climate change scepticism, media consumption and right-wing populism as constitutive mechanisms relating to conservatives' attitudes towards climate change (Yan et al. 2021). This is discussed below in relation to the interaction between politics and postmaterialism.

7.3.2 Conservative Postmaterialism?

Inglehart and Norris's (2017) conclusion that the emergence of these right-wing populists is evidence of the 'cultural revolution' in reverse requires exploration in relation to the findings of this research. Ibid contend that a polarisation between the postmaterialist and authoritarian populists has emerged, namely on issues of ethnic diversity, gender equality, authoritarianism and environmental issues. It is ibid's contention that this represents a backlash against the proposed cultural revolution towards postmaterialism. However, this does not fit with the findings of this research, wherein the right-wing who align with postmaterialism signal lower risk perception. This mirrors the findings for the US in the first analysis, indicating that this may be a signal of a broader politico-cultural shift across countries.

It should be caveated that the difference in risk perception between materialist and postmaterialist centre-right and right/far-right individuals is small and may not be a function of postmaterialism. Nonetheless, the finding that left-postmaterialists and right-postmaterialists[26] are distinct from one another, while there is at most a minor difference between left and right materialists. In context of Inglehart and Norris' arguments, it is reasonable to question the robustness of the 4-point index for postmaterialism's relationship with climate change risk perception, and whether it is more appropriate to analyse the individual elements of the index instead[27]. For the purposes of this discussion, however, this definitional issue is secondary to the identified, significant relationship between the prioritsation of free speech and giving people more say in the government with politics and climate change.

The aversion of right-affiliated individuals who say they prioritise free speech and democratic representation to climate change risk perception may be explained in-part by the development of contemporary political cleavages, not wholly distinct from Inglehart and Norris' proposed axis but differing from the stricter perspective of postmaterialism as essentially pro-environment, pro-ethnic diversity, etc. It may be the case that the postmaterialist right are

[26] Inglehart would likely consider this an oxymoron, however, for the purposes of this discussion 'postmaterialist' merely refers to individuals who prioritise both free speech and giving people more say in the government.

[27] Further, analysis pertaining to the 12-point index would be illuminating to explore this in more detail.

those who have emerged as the more vehement supporters of this authoritarian populist movement, which would coincide with the rhetoric forwarded by the leaders of these movements, discussed below. There is certainly a large base of support amongst the materialist-right, however, and to confirm this link further research into this relationship is necessary. Nonetheless, the aversion to climate change risk perception being most strongly associated with the postmaterialist right could coincide with this recent populist political phenomenon and potential explanations should be explored.

The emergence of the so-called populist right-wing, characterised by party leaders including Donald Trump, Victor Orbán, Nigel Farage and Marine Le Pen, as well as ideologies pertaining to ethnonationalism, and 'populist authoritarianism' offer some potential explanations for the identified effects, with climate skepticism and denial being prevalent amongst these movements (Jylhä & Hellmer, 2020; Yan et al. 2020; Haas, 2020). This is not to say right-wing populism and its aversion to climate change is peculiar to the Christian majority countries, with Narendra Modi and Recep Tayyip Erdoğan offering examples outside of this frame. However, as the difference between Christian majorities and other religious majorities in terms of the effect of political affiliation was identified in the research, the former are of particular interest here.

These leaders' relationships to issues including free speech and democratic representation varies somewhat, with contradictory claims of its integral role in US life from the former US president Trump; regular attacks on the press (Kalb, 2018), multiple calls for those who burn the American flag to be given prison terms (Samuels, 2024; Pichrtova, 2024), while also championing and appointing Elon Musk, who has positioned himself and his platform 'X', formerly known as Twitter, as bastions of free speech and protectors of the first amendment (Timm, 2024). Right-wing populist candidates, particular in the US and Europe can be characterised as walking a fine line between maintenance of elements of the liberal democratic order which are deemed as favorable by their base (Harris, 2015), while also appealing to the illiberal elements driving the discontent amongst its voters as well as the tendencies of these strong-man leaders. Legislation and executive actions from leaders like Orbán (HRI, 2024) and Modi (Sinha, 2021), in Hungary and India respectively, provide more concrete examples of

authoritarianism in relation to free speech and democratic representation, which are countries where liberalism has a less established history.

It is possible that some of these leaders use the aesthetic and tactical deployment of free speech and democratic representation effectively to ensure their base who prioritise these issues feel represented. On top of this, literature pertaining to group perspectives on free speech indicate a potential in-group, out-group variation, with perceptions of prejudice being orientated primarily towards out-groups or 'them' over 'us', the ingroup (Wang et al. 2021; Almagro et al. 2023). Ibid argue this is psychologically bound to notions of free speech and truth, wherein speech as prejudice is perceived as relevant primarily in relation to the views of the other. This extends to uneven support for bans on social media platforms, where in-group bans are more vigorously protested than those of the out-group (Antonetti & Crisafulli, 2021). Therefore, free speech must be viewed as within a spectrum of what is considered socially acceptable, which will vary across ideological groups. Therefore, while free speech may be considered a priority for postmaterialists, conceptions of what constitutes free speech likely leans towards respective in-groups, in this case those with shared political values.

This form of in-group bias could also shape individual conceptualisations of democratic representation, leading to alignment with these populist authoritarian leaders too. The concept of 'the people'[28] is commonly explored in literature due to its capacity to divide in-groups from out-groups and/or offer a false sense of democratic legitimacy to popular causes (Weale, 2018). This populism is often paired with anti-establishment and anti-intellectual framing, i.e. Trump's call to 'drain the swamp' (BBC, 2016), Michael Gove's pro-Brexit statement that "people… have had enough of experts" (Mance, 2016). Jylhä & Hellmer (2020) indicate that such antiestablishment attitudes are correlated with climate change denial and pseudoscientific beliefs relating to vaccines.

This also pertains to the earlier conversation regarding reactionary politics, wherein contemporary conservative politics can be seen as both a backlash (against liberalism and

[28] 'The people' is also the precise language used in the postmaterial index, and as such this discussion seems particularly relevant.

contemporary political priorities i.e. immigration, climate change, etc. à la Inglehart and Norris) while also a dialectical integration of this movement into the contemporary language and priorities of a more postmaterialist society (à la Derrida (1994)), framing itself in terms of populism, free speech and democratic representation. This is not a phenomenon unique to contemporary politics, with clear comparisons that can be made with 20th century fascistic movements in Europe, which instead co-opted the explicitly materialist concerns of the working class that were paradigmatic of politics during the period. This apparent contradiction in political priorities may help explain the variation between the postmaterialist left and postmaterialist right on the issue of climate change risk perception. Further research relating to other contemporary issues such as immigration and globalisation is necessary to clarify whether this is a trend that can meaningfully explain contemporary political polarisation and cultural shifts.

7.3.3 Left-wing homogeneity in risk perception across countries

The random slopes identified notably low variation in risk perception between left-wing affiliated individuals in the 28 countries. There are several possible explanations for this phenomenon, which contrast to an extent with studies indicating higher levels of heterogeneity for both far-left and far-right individuals compared to 'moderates' (Hanel et al. 2019). Firstly, traditionally left-wing causes can be incorporated into an environmental framework from several different perspectives i.e. environmental justice, cosmopolitanism and global citizenry. This is in some way evidenced by left-wing initiatives for 'green new deals' in many countries including the US, UK, Australia, Canada, South Korea and the EU (Boyle et al. 2021). These plans tend to combine the issues of economic inequality, declining working standards and environmental protections and higher levels of international cooperation into a unified policy goal. It is likely the case that left-wing individuals prioritise one (or more) of the above issues and recognise the potentially deleterious nature of climate change to addressing said issues. This may contribute to the appearance of unity within the ideological group, while specific reasons for the high levels of risk perception may nonetheless vary substantially on an individual basis.

Therefore, while this does not directly contradict Hanel et al. (2019), who did not discuss climate change or environmental issues in their research, it does indicate that in-group ideological unity can and does vary substantially according to the specific issue.

Furthermore, the discussions regarding motivated reasoning in relation to conservative aversion to climate change may also play a role in driving high risk perception amongst left-wing individuals too; the prioritsation of traditionally left-wing causes may lead individuals to identify the radical challenge posed by climate change as an opportunity to direct society towards these egalitarian goals. As well as general directional goals including desire for social consensus amongst friends (Bayes & Druckman, 2021), the possibility of climate change being identified as a political vehicle for social change for the left, and a threat to the established social order for the right, fits the general disposition of these ideological categories. This ideological motivation likely functions regardless of the empirical reality of the threat posed by climate change, with the multidimensional nature of risk offering a flexible conception through which ideological groups can direct their general worldviews.

7.3.4 Wealth and Political Affiliation

The evidence of lower centre-right and far-right climate change risk perception in wealthier countries is a finding which may supplement the effects of both conservatism in general and postmaterialism, however, it is reasonable that per capita wealth could exert unique effects beyond what has already been discussed. It is also important to note that the general effect of GDP per capita for world risk perception is still positive, where individuals in wealthier countries have higher risk perception, and as such the centre-right trend is counter to this.

The wealth of a country may have deleterious effects on centre-right individuals' risk perception for several reasons. Firstly, the position of general material security experienced by individuals in wealthier countries may have some influence, with generally lower climate risk indices than poorer countries due to factors of geographical proximity to the direct effects of climate change, as well as preparedness and capacity to deal with those effects. This contrasting trend for conservatives as opposed to other groups would necessitate an effect specific to this ideology too, however, which could be down to several factors. Većkalov et al. (2021) emphasise the importance of future orientation in guiding both perception and

behaviour, with conservatives more likely to view climate change as a temporally distant issue, as well as show less concern regarding the future consequences of these actions. This could explain the gap between countries based on wealth, where the consequences for inaction and the ongoing effects of climate change may be less prevalent due to geography or the capacity of governments to intervene and provide aid to communities impacted.

This explanation is not wholly sufficient, however. The distinction between country and world risk perception will be explored further below, and here it may provide some important context. The positive effect of GDP persists only for world risk perception, while the negative effect of conservativism for both country and world risk perception may indicate a more general aversion to the issue of climate change. The positive effect of GDP on world risk perception, explored in a section above, forwarded the notion that it may be a luxury of individuals in wealthy countries to observe global issues at a similar level of concern to more localised issues, due to higher levels of stability in their home countries. This caveat appears to necessitate the influence of the factors related to conservatism explored in the prior two sections, relating to SDO and postmaterialism more specifically.

Conservative individuals' motivated reasoning relates to the perceived threat of climate policy towards traditional, hierarchical social structures, in comparison to climate change itself. In relation to SDO and status threat, the perspective that was outlined in section 5.3.1 emphasised the fear of loss of social in-group dominance, as a motivator for conservative ideology, for which wealth makes a reasonable indicator. This perspective encapsules part of the backlash described by Inglehart and Norris (2017), wherein conservatives, particularly those in advanced economies, have become increasingly critical of social, cultural, and economic globalisation in favour of traditional forms of social organisation (Kiely, 2020). However, several factors require exploring to understand where the mechanism for this occurs, and how it relates to climate change.

Working class voting for right-wing parties could partly explain this shift, with evidence of those who traditionally voted for centre-left and left parties shifting towards right-leaning parties post 2008 (Polacko, 2021). Relative precarity and economic insecurity are forwarded as drivers

of working-class populism and radicalism on both the left and right (Zhirnov et al. 2023). However, evidence regarding economic security as a driver of right-wing populism is quite limited with this being more prevalent in driving populist/radical left parties. (Simpa et al. 2023). In contrast, the sense of insecurity fueling the right appears to coincide with a cultural backlash. For example, prevalent issues such as trans rights, immigration and Islam have become popular talking points amongst the radical right movements and parties. Indeed, Malka et al. (2014) show that across 51 countries that while perceived need for economic security yields left-wing preferences, the same needs influence cultural conservatism. Further, economic issues (and individuals' left-wing tendencies on said issues) become less prevalent when said individuals are politically engaged. Therefore, the politically engaged working-class are more likely to favour conservative cultural elements, which does coincide with the backlash against issues associated with globalisation.

The evidence regarding the impact of postmaterialism also decreases the likelihood that the identified trends can be explained by economic insecurity, while contributing to the notion that climate change is conceptualised by many (Hoffman, 2019), though to a greater degree the more climate sceptic conservatives, as a cultural issue. The materialist orientation still represents a majority across societies, and the evidence indicates at most a small difference between left and right materialists regarding climate change risk perception. Therefore, those who identify economic growth and national stability as their priorities do not differ significantly based on political ideology. Instead, amongst those who prioritise democratic representation and free speech resides the area where individuals are particularly divided. This lends credence to the cultural insecurity argument outlined above and contributes to the perspective that the mechanism dividing conservatives from other political groups is situated in a form of cultural backlash identified by Inglehart and Norris (2017), with the caveats outlined in the prior section.

7.3.5 Attendance of Religious Services and Politics

The influence of attendance of religious services on political affiliation's effect on climate change risk perception indicates an important moderating effect from this form of religiosity. The first indicates that across countries, centre affiliated individuals have lower risk perception

if they attend religious services. This is country dependent to a degree, where the prominence of political parties aligned with ideological categories is an important factor in terms of its representativity of the population. This relationship between religious attendance and politics highlights that several elements of religiosity, both sustained attendance across countries and affiliation in the US (Arbuckle, 2017), can influence other aspects of ideology when it comes to climate change perceptions. It also highlights a reason for variation amongst individuals affiliated with the same political ideologies and/or parties.

Referring to the conversation in section 7.2.1 regarding the unique effect of religious affiliation upon risk perception in the US, as well as its unique moderating effect on political affiliation, this finding fits reasonably into the conclusions drawn. As stated, conservative religiosity is far more prevalent in the US compared to other high-income countries. Meanwhile, where conservative religion is less present across the general population, the impact of religious doctrine is likely to be more restricted to those who attend regularly. While religious affiliation in these countries may still be fairly high, the evidence from Finland and Japan, and the lack of effect for religious affiliation across the 28 countries indicated that religion plays a predominantly cultural role in these countries. However, those who attend religious services regularly are most likely to engage with the tenets of their faith to a greater degree. Therefore, the unique effect identified in the US may be explained by the fact that more fervently religious individuals represent a small minority in many of the other countries analysed, particular those with a higher proportion of Christians. This may explain both the impact of both attendance of religious services upon risk perception, as explored in the theory, as well as the moderating effect upon politically centre-affiliated individuals identified in this analysis.

7.4 Accounting for the differences between country and world risk perception

Throughout the analyses there was some variation in how each factor impacted both country and world risk perception. While the literature review underlined many of the conceptual differences, it remains important to discuss reasons for the variation between the two measures in relation to the specific contributors and results established in the analysis chapters. In most cases, results for country and world risk perception did not differ substantially.

The positive effects of GDP and postmaterialism were both restricted to world risk perception. There are multiple potential explanations for these differences. Firstly, interpretations of what represents a risk to a country and the world can differ substantially. Theories proposed emphasise the varied experiences of individuals in countries divided by wealth. Inglehart (1995) emphasises the importance of direct experience of environmental degradation and climate effects in poorer countries, supplemented by more limited capacity to deal with these issues, as important for the formation of environmentalism in poorer countries. Meanwhile, a shift in subjective and cultural values in richer countries has increased concern for the environment, and perhaps the anthropogenic origins of the crisis. These differences are proposed to produce two worlds of environmentalism (Mayerl & Best, 2018). Ibid (2018) indicates that wealth positively influences pro-environmental attitudes including concern, and further wealth moderates the effect of postmaterialism on environmental concern. In richer countries, the positive effect of postmaterialism is stronger than in poorer countries. This indicates that the values that influence environmentalism vary across countries based on wealth, and therefore interpretations of environmental problems are likely to vary too.

The postmaterialist interpretation of environmental problems may be more well suited to conceptualising climate change as a global problem, thus contributing to higher world risk perception. The generally higher number of postmaterialists in wealthy countries, alongside the positive effect of postmaterialist values, would therefore contribute to higher world risk perception. Meanwhile, the emphasis on direct experience as a driver of environmentalism in poorer countries indicates more localised issues could produce similarly high country risk perception, while not necessarily representing a global issue. Therefore, this may manifest in lower world risk perception amongst individuals in poorer countries. Therefore, while it is incorrect to argue that individuals in developing countries lack environmental values (Brechin & Kempton, 1994) and climate change risk perception (Mayerl & Best, 2018), there is evidence that variations in values, and the interpretations of climate change and environment issues supplemented by these values, does influence the variation in world risk perception identified in this analysis.

7.5 Limitations

The number of countries was useful for exploring the topics analysed, however, there are some limitations within the available data relating to important contributors to climate change risk perception that could not be included, as well as the set of countries that were included.

Beginning with missing contributors, as noted in section 7.3.2, media is an area that would have been useful to be able to explore. Evidence from the literature indicates that media has a substantial effect upon climate change risk perception in multiple different countries (Ophir et al. 2024; Paek & Hove, 2024). This factor likely explains some of the variation across political categories, particularly in countries where climate change coverage has been more sceptical and politicised. Further analysis of this contributor alongside political affiliation could have enabled greater understanding of the dynamics of political ideology's contribution to climate change risk perception, with an analysis of differences between countries based on types of media consumption as well as the general ideological biases of the media organisations themselves.

The set of 28 countries was useful for the analysis undertaken but certainly limited the scope of the multilevel analysis in some ways, particularly on the aggregate level. The lack of other Abrahamic religions on a country-level meant that comparisons between Islam, Judaism and Christianity, or Hinduism and Buddhism, was not possible, as well as the ability to explore the typology outlined in the theory section in more depth. This limitation was evident in the analysis, with Eastern religions combined as an aggregate level measure. While this was theoretically valid, due to the theological similarities between Hinduism and Buddhism in relation to the typology, and the clear contrasts with Abrahamic religions but also Christianity in particular, it nonetheless reduces the precision and utility of the conclusions. Future research pertaining to majority religion should ideally have a wider scope, with a more representative global sample of countries.

Similarly, most of the countries included were relatively high-income countries, with more than half being European democracies. While this was useful for the purposes of analysing political affiliation, due to established typologies and mechanisms which were incorporated into analysis

and discussions i.e. the effect of right-wing populism and its relationship with Christianity, a more rounded global perspective would have been useful. The GDP analysis was somewhat limited by the lower proportion of low-income countries, which made comparisons to past literature somewhat difficult. Fortunately, the set of countries used by the ISSP in the prior environment module (2010) did mean that a limited number of comparisons could be made to literature utilising that survey.

The methodology of this research also restricted the capacity of the analysis to test and validate many of the expectations outlined in the theory section. The typology outlined identified spectrums pertaining to humanity's relationship with nature, from biocentric to anthropocentric, and capacities to influence worldly phenomena, from determinism to free will. Both are considered important mechanisms that are expected to meaningfully contribute to the differences between religious perspectives when it comes to climate change. The efficacy measures (personal and collective) may offer some level of correlation to questions of free will, however, due to the lack of specificity in the questions relating to the efficacy measures, it was deemed inappropriate to treat them as stand-ins for the existential questions posed by notions of free will, divine intervention and determinism. More focused qualitative research and purposed quantitative research design can help further explore these proposed mechanisms and contribute to a more developed understanding of the contribution of religious ideology to climate change and environmental perceptions.

Mixed methods or a qualitative approach would have enabled the development and more rigorous testing of the theory of religion too. For example, the questions of free will and determinism were not fully explored due to the lack of the available data. While this could be included in future large-N surveys, theoretical development from a qualitative perspective could provide evidence regarding the inner understandings of individuals regarding their perspectives on human agency, divine intervention and how they related to climate change. This critique could be applied to most findings developed throughout this research. While the quantitative analysis undertaken here allows for the development of correlations and theorisation of causal mechanisms, further clarity from subjective interpretations of these concepts and phenomena offers an alternative, and important, lens of analysis. This will be

important to fully develop scholarly understandings of both the theoretical concepts and the findings of this research, which are relatively novel and require further validation and replication from future quantitative analysis, as well as in-depth qualitative work to understand specific subjectivities that are arguably absent from analysis based on survey data.

7.6 Conclusion

This thesis has provided clear evidence that regarding the importance of sociological contributors to climate change risk perception, with evidence that religion, politics and postmaterialism influence individual's risk perception in various ways across countries. The analysis of Finland, Japan and the USA indicated many asymmetries associated with the individual-level metrics for both the core contributors as well as additional sociodemographic and attitudinal measures. The USA indicated a unique relationship with religious affiliation, not mirrored by the other two countries nor in the 28-country analysis. Nonetheless, the interplay between attendance and religious affiliation across countries remains an important question to address, which may indicate that this relationship persists across smaller communities in the other countries, while maintaining a more general presence across the USA.

Similar asymmetries were observed across countries, with attendance of religious services, majority religion and GDP identified as clear mechanisms influencing the differences observed across countries. For attendance of religious services, the random slopes did emphasise that this individual-level contributor generally aligned with the countries separated by majority religion. The distinction between Christian majorities and Eastern religious majorities emphasised the importance of exploring factors beyond a single level of analysis, with the institutional variations influenced by the legacies of differing religions introduced in prior literature having been empirically validated throughout this research. Therefore, the emphasis on religion was justified through the empirical analysis, and this research hopes to influence further interest in developing more comprehensive explanations of the role of ideology in driving climate change risk perception across the world.

Furthermore, the research uncovered important nuances underlying the apparent left/right political polarisation across countries, with evidence that traditional cleavages provide some

indication of this polarisation yet must be considered alongside contemporary cultural shifts captured by the postmaterialist priorities of freedom of speech and popular representation. Individuals who prioritise these issues, while differing with regards to their political affiliation, appear to be those finding themselves in extensive disagreement regarding the seriousness of the threat posed by climate change and being the groups that primarily explain this polarisation. Intra-group analysis also identified very low variation amongst left-wing individuals across countries with high variation amongst right/ centre-right individuals, while also highlighting the various ways in which left-wing individuals may come to have high risk perception. The research emphasised mechanisms including Christianity majorities, high country wealth and postmaterialism as integral to explaining the conservative effect on climate change perceptions. Future efforts at climate communication may find it useful to consider these factors in future endeavors to engage more individuals with the issue.

For example, the underlying priorities of politically affiliated individuals should be considered in developing and implementing communication strategies. Rather than merely focusing on scientific consensus and the benefits of economic growth, the implications of this research imply that more should be done to emphasise the capacity for climate initiatives to empower communities, families and individuals, while also emphasising the localised negative effects of climate change. Climate change policy is often framed in negative terms, wherein a perceived loss of freedom is pervasive across societies. Emphasis on the opportunities to expand both positive and negative freedoms through future initiatives may prove productive. These elements correspond more closely to the more populist leaning priorities outlined as vital to understanding the political divide regarding climate change risk perception. Policy efforts should reflect these more holistic strategies to understand the ideological reasoning behind individual perspectives. As noted, most individuals see climate change as at least somewhat of a threat, and initiatives that identify and consider the broad spectrum of priorities and perceptions throughout the process of drafting and implementation are more likely to have broader public appeal.

There are also implications from the analysis of religion that may have utility in developing more effective communication strategies. Firstly, the indication that religious attendees tend to

have lower risk perception compared to the general population, particularly in Christian majority countries, emphasises two important areas wherein communication strategies can adjust to target specific groups across societies. The nature of these communities incurs difficulties for nationwide communication efforts targeting broad swathes of the population, as these groups may not only adhere to principles and beliefs but may also have significantly lower exposure to contemporary forms of communication, either intentionally or not. In this case, efforts to engage through religious and community leaders, and other gatekeepers, may prove fruitful in contributing to greater resonance regarding climate change and related initiatives within these communities.

A further consideration, which also extends to institutional efforts more broadly too (emerging from the analysis of majority religion too), is the role that narratives and deference to historical symbols, artifacts and traditions may play in galvanising a broader coalition of responses to an issue as broad in scope and effect as climate change. Finland offers an example of how this may be effective, with its incorporation of the historically Christian concept of environmental stewardship into its broadly secular educational curriculum. This synthesis of traditional religious doctrines alongside an emphasis on empirical understanding of global ecosystems within its education system corresponds to lower levels of polarisation across society in terms of religious groups. While this cannot be considered causative, with other country-specific factors likely exerting some influence, the principles outlined in this approach appear reasonably orientated towards greater levels of consensus regarding environmental perspectives in the country. Incorporation of historically resonant concepts and narratives into contemporary climate communication efforts may prove fruitful, provided care is taken to ensure that the potential for alienation of other sectors of society is minimised.

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9. Appendix

Table 9.1 Finland Political Affiliation Interaction Effect Models

	1	2	3	4	5	6
Finland Pol (Social Dems)						
2 True Finns	-0.995	-0.739	-0.329	-0.383	0.298	0.090
	(0.499)	(0.457)	(0.470)	(0.429)	(0.677)	(0.619)
3 National Coalition Party	-0.532	-0.422	0.516	0.327	0.150	0.077
	(0.472)	(0.436)	(0.501)	(0.467)	(0.681)	(0.634)
4 Centre Party of Finland	-2.219	-0.541	-0.659	-0.114	-0.215	0.336
	(0.787)	(0.695)	(0.692)	(0.640)	(0.722)	(0.658)
5 Green League	0.202	0.437	0.899	0.611	0.928	1.268
	(0.472)	(0.439)	(0.483)	(0.446)	(0.704)	(0.655)
6 Left Alliance	-0.018	0.311	1.086	0.894	1.910	1.442
	(0.528)	(0.488)	(0.502)	(0.463)	(0.912)	(0.853)
7 Swedish People's Party	-2.333	-1.467	-0.385	-1.854	1.305	1.731
	(0.931)	(0.865)	(1.902)	(1.768)	(0.961)	(0.899)
8 Christian Democrats	-1.796	-1.511	-1.074	-0.682	-0.533	0.157
	(1.120)	(1.043)	(1.027)	(0.953)	(1.176)	(1.103)
Other	0.271	-0.169	1.053	0.272	0.547	-0.325
	(0.707)	(0.655)	(0.727)	(0.674)	(0.689)	(0.648)
Refused	-1.146	-0.736	-0.237	-0.243	0.149	0.533
	(0.415)	(0.384)	(0.401)	(0.367)	(0.568)	(0.522)
Religious Affiliation						
1. Catholic	0.416	0.497	0.389	0.950	0.447	0.708
	(0.815)	(0.758)	(0.909)	(0.846)	(0.811)	(0.763)
2. Protestant	0.076	-0.227	0.336	-0.044	0.032	-0.219
	(0.158)	(0.147)	(0.406)	(0.372)	(0.159)	(0.149)

3. Orthodox	0.341	-0.449	1.007	0.458	0.403	-0.280
	(0.669)	(0.622)	(2.170)	(2.017)	(0.665)	(0.625)
4. Other Christian	-0.254	-0.631	-0.171	-0.191	-0.022	-0.799
	(0.514)	(0.479)	(0.758)	(0.704)	(0.499)	(0.469)
6. Islamic	-1.147	-1.806	-0.993	-1.535	-1.084	-1.778
	(2.464)	(2.293)	(2.477)	(2.304)	(2.461)	(2.315)
7. Buddhist	-1.094	1.575	-0.935	1.758	-1.080	1.668
	(2.095)	(1.950)	(2.104)	(1.957)	(2.095)	(1.971)
10. Other Religions	1.063	1.726	1.329	2.533	1.351	2.663
	(1.389)	(1.293)	(1.335)	(1.241)	(1.322)	(1.243)
Attendance						
Once a month or less	-0.964	-0.431	-0.103	0.018	-0.114	0.003
	(0.429)	(0.395)	(0.153)	(0.142)	(0.152)	(0.143)
More than once a month	0.083	-0.002	-0.065	-0.572	-0.228	-0.790
	(1.054)	(0.979)	(0.382)	(0.352)	(0.376)	(0.351)
Postmaterialism (Materialist)						
Postmaterialist	-0.029	0.178	0.052	0.202	0.637	0.520
	(0.217)	(0.200)	(0.218)	(0.200)	(0.626)	(0.582)
Neither	0.006	0.042	0.064	0.059	0.657	0.866
	(0.183)	(0.168)	(0.184)	(0.169)	(0.542)	(0.500)
Personal Efficacy	0.069	0.106	0.082	0.129	0.046	0.121
	(0.075)	(0.070)	(0.075)	(0.070)	(0.075)	(0.071)
Collective Efficacy	0.468	0.327	0.449	0.313	0.456	0.302
	(0.075)	(0.069)	(0.075)	(0.069)	(0.075)	(0.070)
Age of respondent	-0.027	-0.020	-0.028	-0.020	-0.028	-0.018
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Sex	0.029	0.029	0.091	0.033	0.085	0.060
	(0.136)	(0.126)	(0.136)	(0.126)	(0.136)	(0.127)
Education						
Lower Secondary	0.292	0.559	0.234	0.540	0.339	0.603
	(0.242)	(0.226)	(0.245)	(0.227)	(0.247)	(0.231)
Post secondary/ short-cycle tertiary	0.082	0.033	0.086	0.056	0.050	0.038
	(0.192)	(0.178)	(0.193)	(0.178)	(0.193)	(0.180)
Lower Tertiary	0.092	0.270	0.068	0.313	0.115	0.333
	(0.204)	(0.190)	(0.205)	(0.191)	(0.205)	(0.193)
Upper Tertiary	0.355	0.448	0.337	0.450	0.334	0.430
	(0.216)	(0.200)	(0.217)	(0.201)	(0.217)	(0.204)
PhD, Post-tertiary	0.534	0.655	0.540	0.712	0.609	0.683
	(0.490)	(0.456)	(0.493)	(0.458)	(0.496)	(0.466)
Income Quartiles						
Lower Middle	0.097	-0.174	0.126	-0.148	0.150	-0.081
	(0.196)	(0.181)	(0.196)	(0.182)	(0.196)	(0.184)
Upper Middle	0.227	0.054	0.269	0.015	0.287	0.091
	(0.198)	(0.183)	(0.199)	(0.185)	(0.197)	(0.186)
Upper	-0.211	-0.317	-0.248	-0.365	-0.148	-0.233
	(0.218)	(0.202)	(0.219)	(0.204)	(0.219)	(0.205)
Didn't answer	0.318	0.080	0.309	0.038	0.330	0.112
	(0.241)	(0.225)	(0.244)	(0.227)	(0.242)	(0.228)
Pol Aff # Attendance						
2 # Once a month or less	0.716	0.378				
	(0.596)	(0.548)				
2 # More than once a month	1.834	-5.374				
	(1.557)	(1.447)				
3 # Once a month or less	0.448	0.377				
	(0.553)	(0.512)				
3 # More than once a month	-2.630	-0.489				
	(2.069)	(1.924)				
4 # Once a month or less	1.795	0.475				

	(0.850)	(0.756)				
4 # More than once a month	0.290	-1.115				
	(1.469)	(1.332)				
5 # Once a month or less	0.691	0.246				
	(0.563)	(0.523)				
5 # More than once a month	-1.134	0.793				
	(1.752)	(1.630)				
6 # Once a month or less	0.946	0.395				
	(0.696)	(0.645)				
7 # Once a month or less	2.155	1.586				
	(1.036)	(0.963)				
8 # Once a month or less	1.680	1.115				
	(1.277)	(1.189)				
Other # Once a month or less	0.851	0.126				
	(1.247)	(1.158)				
Refused # Once a month or less	1.103	0.649				
	(0.485)	(0.448)				
Refused # More than once a month	0.237	0.248				
	(1.200)	(1.115)				
Pol Aff # Rel Aff						
2 # 2. Protestant			-0.184	-0.184		
			(0.575)	(0.527)		
2 # 3. Orthodox			4.086	2.871		
			(3.068)	(2.852)		
2 # 4. Other Christian			1.132	-4.678		
			(1.312)	(1.219)		
3 # 2. Protestant			-0.909	-0.619		
			(0.574)	(0.534)		
3 # 3. Orthodox			-3.515	-3.118		
			(2.636)	(2.452)		
3 # 4. Other Christian			1.140	0.893		
			(2.010)	(1.870)		
4 # 2. Protestant			-0.203	-0.205		
			(0.761)	(0.703)		
4 # 4. Other Christian			1.160	0.242		
			(2.051)	(1.907)		
5 # 1. Catholic			0.880	-0.919		
			(2.132)	(1.984)		
5 # 2. Protestant			-0.287	0.068		
			(0.567)	(0.525)		
5 # 3. Orthodox			-1.590	-0.971		
			(2.763)	(2.569)		
6 # 2. Protestant			-0.893	-0.591		
			(0.689)	(0.637)		
7 # 2. Protestant			-0.338	1.657		
			(1.950)	(1.812)		
8 # 2. Protestant			0.424	-0.067		
			(1.143)	(1.061)		
Other # 2. Protestant			-0.272	-0.454		
			(1.168)	(1.085)		
Refused # 2. Protestant			-0.193	-0.039		
			(0.474)	(0.436)		
Refused # 3. Orthodox			-0.122	-0.451		
			(2.361)	(2.195)		
Pol Aff # Postmaterialism						
2 # Postmaterialist					-1.389	-0.655
					(0.916)	(0.848)
2 # Neither					-0.703	-0.901

					(0.751)	(0.690)
3 # Postmaterialist					-0.353	0.034
					(0.885)	(0.828)
3 # Neither					-0.435	-0.396
					(0.739)	(0.689)
4 # Postmaterialist					-0.591	-0.447
					(1.102)	(1.024)
4 # Neither					-0.662	-0.788
					(0.798)	(0.730)
5 # Postmaterialist					-0.229	-0.369
					(0.855)	(0.797)
5 # Neither					-0.318	-0.804
					(0.775)	(0.724)
6 # Postmaterialist					-1.478	-0.574
					(1.074)	(1.006)
6 # Neither					-1.482	-1.109
					(1.021)	(0.955)
7 # Postmaterialist					-3.174	-1.950
					(1.593)	(1.496)
7 # Neither					-2.312	-2.520
					(1.075)	(1.006)
8 # Postmaterialist					1.601	1.034
					(1.426)	(1.338)
8 # Neither					-1.142	-1.388
					(1.293)	(1.212)
Other # Postmaterialist					0.630	0.944
					(1.179)	(1.109)
Refused # Postmaterialist					-0.804	-0.463
					(0.729)	(0.676)
Refused # Neither					-0.574	-1.049
					(0.624)	(0.576)
Intercept	6.358	7.398	5.481	6.882	5.289	6.318
	(0.580)	(0.534)	(0.563)	(0.516)	(0.652)	(0.602)
Observations	909	913	909	913	909	913
	0.18	0.18	0.18	0.17	0.18	0.16

Table 9.2 Japan Political Affiliation Interaction Effect Models

	1	2	3	4	5	6
Japan Pol						
2 Constitutional Dems	-0.097	0.201	-0.188	-0.152	0.298	0.502
	(0.266)	(0.275)	(0.554)	(0.570)	(0.630)	(0.651)
3 Dem Party for the People	0.837	0.853	0.548	1.085	2.296	1.388
	(0.640)	(0.659)	(0.985)	(1.014)	(1.488)	(1.538)
4 KOMEITO	-0.502	-0.430	-0.283	-0.559	-0.980	-0.566
	(0.591)	(0.609)	(0.771)	(0.794)	(0.872)	(0.902)
5 Innovation Party	0.538	0.583	0.389	-0.678	1.180	1.629
	(0.397)	(0.415)	(1.241)	(1.278)	(0.953)	(0.985)
6 Communist Party	0.499	0.253	1.058	1.614	-0.570	0.668
	(0.379)	(0.396)	(0.819)	(0.896)	(1.064)	(1.100)
7 Social Dems	1.647	1.242	1.488	2.099	1.140	0.701
	(0.617)	(0.636)	(1.245)	(1.283)	(0.810)	(0.838)
8 Other	0.496	0.417	0.353	0.704	1.577	0.877
	(0.617)	(0.635)	(0.981)	(1.010)	(1.498)	(1.548)
Refused	-0.004	0.216	-0.054	0.513	-0.031	0.203
	(0.192)	(0.198)	(0.398)	(0.410)	(0.330)	(0.342)
Rel Aff						
4. Other Christian	0.573	0.678	0.183	0.386	-0.018	0.231
	(0.801)	(0.826)	(0.524)	(0.539)	(0.503)	(0.520)
7. Buddhist	0.279	0.145	0.153	0.035	0.166	0.052

	(0.213)	(0.220)	(0.148)	(0.154)	(0.148)	(0.154)
9. Other Asian Religions	-0.011	0.299	-0.392	-0.132	-0.434	-0.166
	(0.526)	(0.542)	(0.380)	(0.397)	(0.381)	(0.399)
10. Other Religions	0.625	1.137	-0.184	-0.472	-0.162	-0.447
	(1.220)	(1.257)	(0.711)	(0.732)	(0.703)	(0.727)
Attendance						
Once a month or less	-0.011	-0.240	0.061	-0.021	0.018	-0.208
	(0.180)	(0.186)	(0.331)	(0.341)	(0.179)	(0.186)
More than once a month	0.706	0.402	0.924	0.934	0.705	0.413
	(0.331)	(0.340)	(0.541)	(0.549)	(0.327)	(0.337)
Postmaterialism						
Postmaterialist	0.538	0.695	0.564	0.696	0.187	0.521
	(0.231)	(0.238)	(0.230)	(0.238)	(0.391)	(0.408)
Neither	0.274	0.480	0.287	0.490	0.418	0.626
	(0.164)	(0.169)	(0.164)	(0.169)	(0.227)	(0.235)
Personal Efficacy	0.212	0.353	0.229	0.364	0.222	0.367
	(0.058)	(0.060)	(0.059)	(0.060)	(0.059)	(0.061)
Collective Efficacy	-0.115	-0.165	-0.114	-0.163	-0.116	-0.165
	(0.057)	(0.059)	(0.057)	(0.059)	(0.057)	(0.059)
Age of respondent	0.008	0.006	0.007	0.006	0.008	0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
RECODE of SEX (Sex of Respondent)	-0.125	-0.079	-0.129	-0.086	-0.129	-0.092
	(0.129)	(0.133)	(0.129)	(0.134)	(0.129)	(0.134)
Education						
Lower Secondary	-0.520	-0.428	-0.492	-0.395	-0.488	-0.377
	(0.218)	(0.227)	(0.217)	(0.226)	(0.217)	(0.226)
Post secondary/ short-cycle tertiary	0.175	0.107	0.205	0.128	0.185	0.125
	(0.177)	(0.182)	(0.178)	(0.183)	(0.177)	(0.183)
Lower Tertiary	0.321	0.176	0.359	0.207	0.351	0.207
	(0.164)	(0.170)	(0.165)	(0.170)	(0.164)	(0.170)
Upper Tertiary	-0.219	-0.130	-0.298	-0.395	-0.285	-0.274
	(0.485)	(0.500)	(0.479)	(0.495)	(0.481)	(0.497)
PhD, Post-tertiary	-0.103	-0.502	-0.167	-0.682	-0.132	-0.525
	(0.797)	(0.822)	(0.805)	(0.830)	(0.800)	(0.826)
Income Quartiles						
2	-0.051	0.285	-0.013	0.310	-0.022	0.311
	(0.190)	(0.197)	(0.190)	(0.197)	(0.190)	(0.197)
3	0.082	0.292	0.094	0.278	0.076	0.285
	(0.194)	(0.200)	(0.194)	(0.200)	(0.193)	(0.200)
4	0.005	0.363	0.007	0.363	0.034	0.368
	(0.208)	(0.215)	(0.209)	(0.216)	(0.208)	(0.216)
5	-0.236	0.146	-0.255	0.139	-0.279	0.091
	(0.254)	(0.261)	(0.254)	(0.262)	(0.253)	(0.262)
Pol Aff # Rel Aff						
2 # 4. Other Christian	-0.872	-0.826				
	(1.461)	(1.506)				
2 # 7. Buddhist	0.284	0.167				
	(0.444)	(0.457)				
2 # 9. Other Asian Religions	-3.537	-4.026				
	(1.580)	(1.629)				
2 # 10. Other Religions	-1.089	-0.935				
	(2.431)	(2.505)				
3 # 7. Buddhist	-2.057	-1.949				
	(0.988)	(1.019)				
4 # 7. Buddhist	0.108	0.188				
	(0.759)	(0.782)				
4 # 10. Other Religions	0.652	-0.398				

	(2.484)	(2.561)				
5 # 4. Other Christian	-1.581	-1.659				
	(2.257)	(2.328)				
5 # 7. Buddhist	-0.852	-1.234				
	(0.715)	(0.740)				
5 # 9. Other Asian Religions	-0.666	0.042				
	(1.606)	(1.657)				
6 # 7. Buddhist	-0.576	0.239				
	(0.938)	(0.913)				
6 # 9. Other Asian Religions	-0.041	0.815				
	(1.353)	(1.645)				
7 # 4. Other Christian	-1.880	-2.226				
	(1.790)	(1.846)				
7 # 7. Buddhist	-0.186	0.467				
	(1.603)	(1.652)				
7 # 9. Other Asian Religions	0.434	-0.654				
	(2.268)	(2.338)				
8 # 7. Buddhist	1.664	1.767				
	(1.222)	(1.260)				
Refused # 4. Other Christian	-0.676	-0.377				
	(1.132)	(1.167)				
Refused # 7. Buddhist	-0.321	-0.235				
	(0.333)	(0.345)				
Refused # 9. Other Asian Religions	-0.559	-0.910				
	(0.909)	(0.937)				
Refused # 10. Other Religions	-1.562	-3.260				
	(1.610)	(1.660)				
Pol Aff # Attend						
2 # Once a month or less			0.171	0.462		
			(0.598)	(0.616)		
2 # More than once a month			-0.997	-0.979		
			(1.019)	(1.046)		
3 # Once a month or less			-0.791	-1.403		
			(1.138)	(1.173)		
4 # Once a month or less			-0.237	0.450		
			(0.895)	(0.922)		
4 # More than once a month			0.232	0.022		
			(1.296)	(1.331)		
5 # Once a month or less			-0.215	0.936		
			(1.288)	(1.327)		
5 # More than once a month			0.220	0.695		
			(1.781)	(1.832)		
6 # Once a month or less			-0.796	-1.534		
			(0.896)	(0.971)		
6 # More than once a month			-1.150	-1.648		
			(1.743)	(1.817)		
7 # Once a month or less			0.180	-1.017		
			(1.387)	(1.429)		
7 # More than once a month			-1.483	-3.150		
			(2.034)	(2.095)		

8 # Once a month or less			0.783	0.269		
			(1.172)	(1.207)		
Refused # Once a month or less			-0.082	-0.484		
			(0.432)	(0.445)		
Refused # More than once a month			-0.284	-0.772		
			(0.771)	(0.789)		
Pol Aff # Postmaterialism						
2 # Postmaterialist					0.333	0.033
					(0.804)	(0.833)
2 # Neither					-0.657	-0.512
					(0.680)	(0.703)
3 # Postmaterialist					-2.812	-2.202
					(2.121)	(2.194)
3 # Neither					-2.620	-1.486
					(1.585)	(1.639)
4 # Postmaterialist					1.307	1.614
					(1.400)	(1.448)
4 # Neither					0.610	0.123
					(0.972)	(1.005)
5 # Postmaterialist					-1.017	-2.396
					(1.251)	(1.295)
5 # Neither					-1.050	-1.421
					(1.025)	(1.062)
6 # Postmaterialist					1.485	-0.153
					(1.200)	(1.242)
6 # Neither					0.964	-0.462
					(1.179)	(1.224)
7 # Postmaterialist					0.933	1.415
					(1.363)	(1.410)
7 # Neither					0.609	0.198
					(1.181)	(1.220)
8 # Postmaterialist					-0.975	-0.392
					(1.952)	(2.018)
8 # Neither					-0.710	0.051
					(1.631)	(1.685)
Refused # Postmaterialist					0.538	0.439
					(0.570)	(0.593)
Refused # Neither					-0.226	-0.232
					(0.376)	(0.389)
Intercept	6.349	5.854	6.274	5.664	6.283	5.783
	(0.432)	(0.447)	(0.483)	(0.500)	(0.438)	(0.455)
	1112	1108	1112	1108	1112	1108
	0.04	0.05	0.03	0.05	0.04	0.05
Adjusted R-squared	0.04	0.05	0.03	0.05	0.04	0.05

Table 9.3 USA Political Affiliation Interaction Effect Models

	M5 Country Risk	M5 World Risk	M6 Country Risk	M6 World Risk	M7 Country Risk	M7 World Risk
Political Affiliation (USA)						
not very strong democrat	-0.346	-0.291	0.071	-0.192	1.661	1.724
	(0.344)	(0.340)	(0.351)	(0.346)	(0.569)	(0.565)
independent, close to democrat	-0.130	0.038	0.208	0.320	0.641	1.523
	(0.345)	(0.341)	(0.358)	(0.354)	(0.573)	(0.569)
independent (neither, no response)	-1.407	-1.895	-0.608	-1.350	0.083	0.122
	(0.346)	(0.343)	(0.316)	(0.308)	(0.516)	(0.513)
independent, close to republican	-0.668	-1.692	-1.617	-2.165	0.741	0.558

	(0.625)	(0.618)	(0.493)	(0.486)	(0.769)	(0.764)
not very strong republican	-1.892	-2.595	-1.192	-1.796	-0.134	-0.208
	(0.498)	(0.492)	(0.429)	(0.433)	(0.656)	(0.652)
strong republican	-2.191	-2.167	-1.765	-2.282	-0.157	0.140
	(0.500)	(0.497)	(0.415)	(0.405)	(0.677)	(0.667)
other party	-1.305	-1.168	-1.174	-1.211	0.999	1.219
	(0.533)	(0.527)	(0.542)	(0.535)	(1.436)	(1.428)
RECODE of relus (RECODE of relig (R'S RELIGIOUS PREFERENCE))						
Catholic	-1.116	-1.531	-0.180	-0.136	-0.299	-0.256
	(0.372)	(0.366)	(0.191)	(0.190)	(0.192)	(0.191)
Jewish	-0.447	0.298	-0.136	0.197	-0.138	0.135
	(0.906)	(0.896)	(0.477)	(0.470)	(0.477)	(0.473)
Protestant	-1.414	-1.161	-0.474	-0.283	-0.571	-0.405
	(0.331)	(0.327)	(0.181)	(0.179)	(0.181)	(0.179)
Other Christian	-1.875	-0.651	-0.657	-0.386	-0.687	-0.461
	(0.762)	(0.753)	(0.314)	(0.306)	(0.313)	(0.308)
Buddhism	0.861	0.721	0.387	0.795	0.371	0.770
	(1.066)	(1.054)	(0.610)	(0.602)	(0.610)	(0.606)
Others	-0.729	-0.976	-0.681	-0.987	-0.736	-1.080
	(1.086)	(1.074)	(0.459)	(0.431)	(0.461)	(0.436)
RECODE of attendus (RECODE of attend (HOW OFTEN R ATTENDS RELIGIOUS SERVICES))						
Less than once a month	-0.236	-0.043	-0.161	-0.095	-0.236	-0.055
	(0.161)	(0.159)	(0.327)	(0.321)	(0.159)	(0.157)
Once a month or more	-0.524	-0.492	-1.360	-1.860	-0.536	-0.541
	(0.181)	(0.178)	(0.342)	(0.338)	(0.181)	(0.179)
RECODE of PM2 (RECODE of pm)						
Postmaterialist	0.141	0.057	0.236	0.176	0.735	1.384
	(0.210)	(0.207)	(0.209)	(0.206)	(0.499)	(0.495)
Neither	0.294	0.111	0.364	0.221	1.149	1.238
	(0.181)	(0.179)	(0.179)	(0.176)	(0.439)	(0.436)
Personal Efficacy	0.339	0.298	0.295	0.265	0.281	0.263
	(0.066)	(0.065)	(0.065)	(0.064)	(0.065)	(0.065)
Collective Efficacy	0.282	0.268	0.326	0.295	0.341	0.315
	(0.065)	(0.064)	(0.064)	(0.063)	(0.064)	(0.064)
AGE OF RESPONDENT	-0.017	-0.015	-0.018	-0.017	-0.019	-0.017
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
RESPONDENTS SEX	-0.067	0.069	-0.088	0.037	-0.058	0.081
	(0.128)	(0.126)	(0.126)	(0.124)	(0.127)	(0.126)
inc2quart						
2	-0.211	0.003	-0.336	-0.183	-0.294	-0.129
	(0.198)	(0.195)	(0.197)	(0.194)	(0.196)	(0.194)
3	-0.346	-0.293	-0.361	-0.379	-0.300	-0.330
	(0.174)	(0.172)	(0.172)	(0.170)	(0.172)	(0.171)
4	-0.311	-0.278	-0.276	-0.314	-0.240	-0.254
	(0.187)	(0.185)	(0.184)	(0.182)	(0.185)	(0.184)
5	-0.336	-0.241	-0.364	-0.372	-0.343	-0.394
	(0.331)	(0.316)	(0.319)	(0.305)	(0.318)	(0.306)
R'S HIGHEST DEGREE						
high school	0.313	-0.134	0.191	-0.316	0.310	-0.161
	(0.218)	(0.215)	(0.214)	(0.211)	(0.214)	(0.212)
associate/junior college	0.298	-0.234	0.202	-0.413	0.255	-0.347
	(0.268)	(0.262)	(0.265)	(0.258)	(0.263)	(0.258)
bachelor's	0.600	0.058	0.476	-0.131	0.624	0.042
	(0.251)	(0.247)	(0.246)	(0.242)	(0.245)	(0.242)
graduate	0.904	0.458	0.802	0.302	0.922	0.420
	(0.274)	(0.270)	(0.271)	(0.267)	(0.269)	(0.267)
POLITICAL PARTY AFFILIATION # RELIGIOUS AFFILIATION						
not very strong democrat # Catholic	1.112	1.570				
	(0.548)	(0.540)				
not very strong democrat # Jewish	-0.671	-1.655				
	(1.264)	(1.251)				
not very strong democrat # Protestant	1.429	0.693				
	(0.505)	(0.500)				
not very strong democrat # Other Christian	2.570	0.915				
	(1.556)	(1.540)				
not very strong democrat # Buddhism	-2.562	-2.695				
	(2.243)	(2.219)				

not very strong democrat # Others	1.083	0.956				
	(1.301)	(1.287)				
independent, close to democrat # Catholic	0.788	1.267				
	(0.580)	(0.573)				
independent, close to democrat # Jewish	1.641	0.147				
	(1.552)	(1.535)				
independent, close to democrat # Protestant	0.618	0.369				
	(0.528)	(0.523)				
independent, close to democrat # Other Christian	1.809	0.604				
	(1.114)	(1.102)				
independent, close to democrat # Buddhism	-0.449	0.173				
	(2.012)	(1.990)				
independent, close to democrat # Others	-1.695	-1.254				
	(1.540)	(1.523)				
independent (neither, no response) # Catholic	1.631	2.418				
	(0.516)	(0.512)				
independent (neither, no response) # Jewish	2.104	1.710				
	(2.366)	(2.341)				
independent (neither, no response) # Protestant	1.825	1.832				
	(0.464)	(0.457)				
independent (neither, no response) # Other Christian	0.662	-0.552				
	(0.968)	(0.942)				
independent (neither, no response) # Buddhism	-0.291	0.125				
	(1.523)	(1.506)				
independent (neither, no response) # Others	0.156	-0.197				
	(1.354)	(1.284)				
independent, close to republican # Catholic	0.119	1.008				
	(0.797)	(0.783)				
independent, close to republican # Protestant	-0.509	0.361				
	(0.737)	(0.731)				
independent, close to republican # Other Christian	0.346	-0.261				
	(1.237)	(1.224)				
independent, close to republican # Buddhism	-1.256	1.898				
	(2.093)	(2.070)				
not very strong republican # Catholic	1.399	2.073				
	(0.667)	(0.665)				
not very strong republican # Jewish	-0.584	1.265				
	(2.177)	(2.153)				
not very strong republican # Protestant	1.317	1.802				
	(0.601)	(0.594)				
not very strong republican # Other Christian	1.207	1.784				
	(1.534)	(1.518)				
not very strong republican # Buddhism	-1.894	-0.341				
	(3.066)	(3.033)				
strong republican # Catholic	0.685	1.031				
	(0.694)	(0.687)				
strong republican # Jewish	-0.467	-1.238				
	(1.561)	(1.545)				
strong republican # Protestant	1.077	0.552				
	(0.578)	(0.573)				
strong republican # Other Christian	2.958	1.755				
	(1.129)	(1.116)				
other party # Catholic	-0.007	0.319				
	(1.585)	(1.568)				
other party # Jewish	3.447	2.276				
	(1.853)	(1.834)				

other party # Protestant	-0.619	-0.400				
	(0.897)	(0.887)				
other party # Other Christian	0.796	-0.887				
	(1.387)	(1.372)				
POLITICAL AFFILIATION#ATTENDANCE OF RELIGIOUS SERVICES						
not very strong democrat # Less than once a month			0.258	0.375		
			(0.474)	(0.467)		
not very strong democrat # Once a month or more			0.821	1.090		
			(0.563)	(0.556)		
independent, close to democrat # Less than once a month			-0.376	-0.560		
			(0.505)	(0.497)		
independent, close to democrat # Once a month or more			0.972	1.351		
			(0.560)	(0.553)		
independent (neither, no response) # Less than once a month			0.071	0.388		
			(0.443)	(0.435)		
independent (neither, no response) # Once a month or more			0.679	1.582		
			(0.475)	(0.466)		
independent, close to republican # Less than once a month			-0.171	-0.240		
			(0.667)	(0.662)		
independent, close to republican # Once a month or more			1.673	2.349		
			(0.650)	(0.639)		
not very strong republican # Less than once a month			-0.609	-0.304		
			(0.565)	(0.564)		
not very strong republican # Once a month or more			1.408	2.149		
			(0.587)	(0.587)		
strong republican # Less than once a month			-0.146	0.064		
			(0.540)	(0.527)		
strong republican # Once a month or more			1.047	1.633		
			(0.532)	(0.522)		
other party # Less than once a month			0.500	0.054		
			(0.876)	(0.864)		
other party # Once a month or more			-0.708	0.411		
			(0.977)	(0.964)		
POLITICAL PARTY AFFILIATION # POSTMATERIALISM						
not very strong democrat # Postmaterialist					-1.217	-2.010
					(0.756)	(0.751)
not very strong democrat # Neither					-1.465	-1.464
					(0.617)	(0.613)
independent, close to democrat # Postmaterialist					0.437	-1.049
					(0.738)	(0.733)
independent, close to democrat # Neither					-0.542	-1.167
					(0.635)	(0.631)
independent (neither, no response) # Postmaterialist					-0.006	-0.864
					(0.645)	(0.642)
independent (neither, no response) # Neither					-0.606	-0.934
					(0.566)	(0.562)
independent, close to republican # Postmaterialist					-1.954	-2.108

					(0.923)	(0.921)
independent, close to republican # Neither					-2.023	-2.212
					(0.836)	(0.831)
not very strong republican # Postmaterialist					-0.346	-1.066
					(0.820)	(0.822)
not very strong republican # Neither					-1.124	-1.133
					(0.716)	(0.712)
strong republican # Postmaterialist					-1.521	-2.490
					(0.811)	(0.795)
strong republican # Neither					-1.365	-1.835
					(0.721)	(0.711)
other party # Postmaterialist					-2.693	-3.179
					(1.565)	(1.555)
other party # Neither					-1.914	-1.871
					(1.516)	(1.506)
Intercept	6.699	7.340	6.491	7.452	5.497	5.828
	(0.520)	(0.513)	(0.509)	(0.501)	(0.607)	(0.602)
Number of observations	1312	1320	1312	1320	1312	1320
Adjusted R-squared	0.23	0.25	0.22	0.25	0.22	0.23

Table 9.4 - Means for Country and World Risk Perception by country

	Country Risk		World Risk	
	Mean	Valid Cases	Mean	Valid Cases
AU – Australia	7.2	1047	7.4	1045
AT – Austria	6.5	1228	7.4	1225
CN – China	6.6	2302	6.7	2317
TW – Taiwan	7.5	1729	7.9	1741
HR – Croatia	6.8	973	7.1	976
DK – Denmark	6.2	1097	7.0	1089
FI – Finland	6.6	1085	7.7	1082
FR – France	7.7	1475	8.0	1450
DE – Germany	6.9	1618	7.7	1609
HU – Hungary	6.7	955	7.0	951
IS – Iceland	6.5	1118	7.5	1101
IN – India	6.7	1242	6.8	1236
IT – Italy	6.8	1097	6.8	1100
JP – Japan	7.4	1414	7.4	1419
KR – South Korea	6.3	1185	6.3	1186
LT – Lithuania	5.8	1130	6.5	1119
NZ – New Zealand	6.9	957	7.5	956
NO – Norway	6.0	1050	6.8	1058
PH – Philippines	6.1	1359	6.0	1362
RU – Russia	5.9	1442	6.3	1432
SK – Slovakia	6.0	892	6.3	909
SI – Slovenia	6.5	1062	7.0	1043
ZA – South Africa	5.9	2321	6.0	2335
ES – Spain	7.9	2126	8.0	2093
SE – Sweden	6.4	1780	7.4	1781
CH – Switzerland	6.8	4139	7.5	4128
TH – Thailand	6.9	1297	7.0	1289
US – United States	6.9	1722	7.1	1709

Table 9.5 - Univariate Statistics of independent variables for 28 countries

	AU	AT	CN	TW	HR	DK	FI
Political Ideology							
Left/ Far Left	0.3	10.8				11.9	
Centre-Left	42	17.4		39.7	10.7	18.1	16
Centre		2.7		2.9	1.6	8.2	13.5
Centre-right	38.7	23.8		15.8	13.2	21.2	22.2
Right/ Far Right	0.9	8.8			1.4	7.3	
Refused/ Didn't Vote	18.1	36.5		41.6	73.1	33.3	48.3
Postmaterialism							
Postmaterial	14.76	16.59	5.37	10.33	12.23	15.51	20.94
Material	21.57	28.17	43.08	23.02	25.91	8.19	15.49
Neither	63.67	55.24	51.55	66.66	61.87	76.30	63.57
Personal Efficacy (1-5)	**3.06**	**3.58**	**2.71**	**3.50**	**3.38**	**3.21**	**3.70**
Collective Efficacy (1-5)	**3.05**	**3.62**	**2.23**	**2.22**	**3.44**	**2.98**	**3.65**
Religion							
No Religion	49.78	22.60	93.51	28.32	7.50	19.12	29.02
Catholic	16.83	64.87	0.18	1.15	86.10	0.42	0.53
Protestant	20.75	6.74	1.31	4.56	0.20	69.45	64.56
Orthodox	1.39	1.90	0.00	0.00	3.20	0.00	1.06
Other Christian	4.88	0.32	0.00	0.00	0.00	0.00	2.20
Jewish	0.26	0.00	0.00	0.00	0.10	0.08	0.00
Islamic	0.87	2.38	1.42	0.38	0.30	0.33	0.18
Buddhist	1.39	0.16	3.14	18.11	0.00	0.00	0.09
Hindu	0.70	0.00	0.00	0.00	0.00	0.00	0.09
Other Asian Religions	0.09	0.00	0.36	47.31	0.00	0.00	0.00
Other	0.78	0.08	0.07	0.11	0.30	0.83	0.26
Attendance of Religious Service (1-3)	**1.59**	**1.86**	**1.09**	**1.71**	**2.15**	**1.61**	**1.73**
Age	**55.67**	**55.37**	**51.60**	**49.48**	**41.46**	**43.81**	**48.74**
Sex (1-2)	**1.29**	**1.52**	**1.54**	**1.57**	**1.55**	**1.48**	**1.55**
Income Quartile							
Lowest (0-25%)							
Lower Middle (26-50%)							
Upper Middle (51-75%)							
Upper (76-100%)							
Education							
No Education	1	0	304	97	0	7	0
Primary	34	2	608	217	12	12	0
Lower Secondary	229	149	762	214	59	59	111
Upper Secondary	196	668	353	481	688	688	319
Post-Secondary, Short-cycle tertiary	228	237	365	188	36	36	271
Lower tertiary (BA)	316	58	307	490	68	68	181
Upper tertiary (MA)/ Postgraduate [US]	89	122	36	115	122	122	218
Post-tertiary (PhD)	21	25	0	18	5	5	26

	FR	DE	HU	IS	IN	IT	JP
Political Ideology							
Left/ Far Left	12.7	4.4		0.1	4.7	1.4	3.5
Centre-Left	9.4	27.2	14.7	20.5	11.2	9.4	1.6
Centre	25	4.5	4.2	8.7	18.3	2.3	15.4
Centre-right	12.8	22.1	38.7	20.2	38.4	20.2	41.8
Right/ Far Right	10.2	2.9				16.3	
Refused/ Didn't Vote	29.9	38.9	42.4	50.5	27.4	68.4	37.7
Postmaterialism							
Postmaterial	21.20	26.99	7.04	12.91	3.77	6.68	14.61
Material	21.97	11.77	40.68	26.13	20.55	33.67	19.62
Neither	56.83	61.23	52.28	60.97	75.68	59.65	65.77
Personal Efficacy (1-5)	**3.46**	**3.29**	**2.84**	**3.45**	**1.73**	**3.40**	**2.69**
Collective Efficacy (1-5)	**3.16**	**3.43**	**3.23**	**3.40**	**1.88**	**3.28**	**2.04**
Religion							
No Religion	49.34	45.06	15.78	21.39	0.00	12.74	62.51
Catholic	44.28	24.56	55.44	1.30	0.91	81.37	0.00
Protestant	1.71	23.74	23.68	58.70	0.07	0.18	0.00
Orthodox	0.07	1.00	0.10	0.35	0.00	0.35	0.00

Other Christian	0.53	0.71	0.10	1.74	1.76	0.35	1.61
Jewish	0.66	0.06	0.10	0.00	0.00	0.00	0.00
Islamic	1.91	1.53	0.00	0.09	10.70	0.88	0.00
Buddhist	0.46	0.24	0.00	0.17	0.56	0.26	30.38
Hindu	0.07	0.06	0.00	0.00	85.22	0.00	0.00
Other Asian Religions	0.00	0.00	0.00	0.00	0.77	0.00	2.68
Other	0.26	0.24	0.20	1.91	0.00	0.26	0.74
Attendance of Religious Service (1-3)	**1.42**	**1.60**	**1.60**	**1.64**	**2.22**	**2.08**	**1.90**
Age	**55.40**	**53.33**	**49.83**	**50.63**	**40.40**	**54.9**	**55.97**
Sex (1-2)	**1.54**	**1.48**	**1.60**	**1.53**	**1.48**	**1.51**	**1.52**
Income Quartile							
Lowest (0-25%)							
Lower Middle (26-50%)							
Upper Middle (51-75%)							
Upper (76-100%)							
Education							
No Education	1	1	0	1	317	11	0
Primary	51	6	8	33	222	101	0
Lower Secondary	119	80	433	103	396	232	186
Upper Secondary	519	663	349	320	232	535	635
Post-Secondary, Short-cycle tertiary	265	226	73	136	3	10	272
Lower tertiary (BA)	112	396	105	225	222	59	344
Upper tertiary (MA)/ Postgraduate [US]	312	269	32	170	29	146	25
Post-tertiary (PhD)	29	39	0	18	0	21	7

	KR	LT	NZ	NO	PH	RU	SK
Political Ideology							
Left/ Far Left	2.1			1.9		6.1	
Centre-Left	39.5	12.4	56.3	26.4	29.1	2.9	15.1
Centre	0.2	13.2	4	14.5	12.3	20.3	4
Centre-right	9.2	13.4	22.4	29.4	0.1	5.2	31.7
Right/ Far Right	20.1		6.4				9.3
Refused/ Didn't Vote	28.9	61	10.9	27.8	58.5	65.5	39.9
Postmaterialism							
Postmaterial	3.49	7.55	13.22	17.82	5.69	6.83	14.83
Material	49.06	18.75	26.95	11.58	44.22	43.83	23.68
Neither	47.45	73.7	59.83	70.59	50.09	49.34	61.49
Personal Efficacy (1-5)	**2.89**	**2.35**	**3.29**	**3.54**	**2.78**	**2.67**	**2.96**
Collective Efficacy (1-5)	**2.88**	**3.10**	**3.23**	**3.50**	**2.40**	**3.41**	**3.26**
Religion							
No Religion	51.95	12.83	41.29	25.20	0.47	26.85	16.78
Catholic	7.55	81.33	11.08	1.59	79.53	0.32	68.51
Protestant	15.60	0.17	0.10	66.84	6.33	0.25	7.60
Orthodox		1.33	0.40	0.80	0.00	64.56	0.10
Other Christian		0.58	34.84	0.71	8.93	0.00	0.10
Jewish		0.08	0.20	0.09	0.07	0.06	0.00
Islamic		0.00	1.51	1.50	4.53	6.32	0.00
Buddhist	21.66	0.08	2.62	0.71	0.07	0.51	0.10
Hindu		0.00	3.02	0.27	0.00	0.00	0.00
Other Asian Religions		0.00	0.50	0.00	0.00	0.00	0.00
Other	1.00	0.67	1.81	0.27	0.00	0.82	0.20
Attendance of Religious Service (1-3)	**1.60**	**1.96**	**1.73**	**1.73**	**2.53**	**1.61**	**1.96**
Age	**52.42**	**51.24**	**50.70**	**51.80**	**43.62**	**46.07**	**47.12**
Sex (1-2)	**1.58**	**1.52**	**1.52**	**1.44**	**1.50**	**1.55**	**1.48**
Income Quartile							
Lowest (0-25%)							
Lower Middle (26-50%)							
Upper Middle (51-75%)							

Upper (76-100%)							
Education							
No Education	56	0	29	10	168	0	0
Primary	142	13	66	0	182	7	0
Lower Secondary	119	140	97	72	607	78	132
Upper Secondary	462	415	167	309	62	267	541
Post-Secondary/ Short-cycle tertiary	134	219	257	175	103	815	20
Lower tertiary (BA)	265	214	198	301	372	0	40
Upper tertiary (MA)/ Postgraduate [US]	22	184	155	249	6	416	271
Post-tertiary (PhD)	3	9	0	0	0	0	9

	SI	ZA	ES	SE	CH	TH	US
Political Ideology							
Left/ Far Left	4.8	4.5	9.2	6.9	0.4		
Centre-Left	13.5	0.4	21.9	30.7	21.3	2.9	
Centre	21.9	55.8	5.5	12.9	6.8	23.9	33.1
Centre-right	18.8	2	8.3	19.3	27	2.8	23.9
Right/ Far Right	1.8	0.7	3.6	10.6	0.8		
Refused/ Didn't Vote	39.2	36.6	51.5	19.6	43.7	70.4	43
Postmaterialism							
Postmaterial	27.75	7.21	9.37	11.27	10.59	17.54	12.8
Material	13.47	24.22	24.12	7.6	27.97	19.04	25.2
Neither	58.79	68.57	66.51	81.13	61.44	63.43	63.4
Personal Efficacy (1-5)	**3.31**	**2.45**	**3.24**	**2.95**	**3.64**	**2.03**	**2.98**
Collective Efficacy (1-5)	**3.40**	**2.49**	**2.73**	**3.20**	**3.40**	**2.19**	**3.19**
Religion							
No Religion	31.22	20.82	36.02	30.30	33.43	0.53	28.21
Catholic	59.80	3.59	53.82	1.04	32.31	0.00	20.19
Protestant	0.64	35.16	1.11	60.70	25.47	0.00	41.15
Orthodox	3.45	0.00	0.67	0.88	1.47	0.00	0.87
Other Christian	0.54	23.98	1.24	0.78	0.42	0.07	2.65
Jewish	0.09	0.14	0.09	0.05	0.30	0.00	1.89
Islamic	2.18	4.54	1.38	0.78	2.90	9.08	0.54
Buddhist	0.09	0.04	0.35	0.16	0.89	90.05	0.92
Hindu	0.09	4.71	0.09	0.10	0.28	0.07	0.76
Other Asian Religions	0.00	0.00	0.22	0.00	0.00	0.07	0.05
Other	0.45	4.43	0.53	0.57	0.54	0.07	1.89
Attendance of Religious Service (1-3)	**1.79**	**2.33**	**1.64**	**1.56**	**1.68**	**2.14**	**2.01**
Age	**49.11**	**42.76**	**49.92**	**55.97**	**49.61**	**45.04**	**48.92**
Sex (1-2)	**1.53**	**1.60**	**1.50**	**1.50**	**1.45**	**1.56**	**1.52**
Income Quartile							
Lowest (0-25%)							
Lower Middle (26-50%)							
Upper Middle (51-75%)							
Upper (76-100%)							
Education							
No Education	6	119	125	11	10	27	31
Primary	18	323	250	132	58	538	62
Lower Secondary	87	379	490	177	447	188	29
Upper Secondary	537	1624	358	748	1794	288	670
Post-Secondary/ Short-cycle tertiary	103	180	272	173	538	138	175
Lower tertiary (BA)	114	169	297	383	537	302	481
Upper tertiary (MA)/ Postgraduate [US]	198	10	401	167	624	13	235
Post-tertiary (PhD)	28	5	25	39	158	3	148

Table 9.6 – Bivariate analysis: country risk perception and independent variables

	ANOVA f-statistic/**Pearson**													
	AU	AT	CN	TW	HR	DK	FI	FR	DE	HU	IS	IN	IT	JP
Political Ideology	41.71*	3.25*		5.11*	.84	8.81*	14.60*	7.71*	9.89*	2.27	19.01*	.57	2.17	3.08*
R^2	.14	.02		.01	.01	.05	.04	.03	.03	.01	.03	.00	.01	.01
Postmaterialism	1.61	7.00*	1.56	3.44*	3.94*	3.21*	2.73	16.48*	.37	.68	1.86	2.29	2.22	3.37*
R^2	.01	.02	.00	.01	.01	.01	.01	.03	.00	.00	.00	.01	.01	.01
Religion	87.59*	9.73*	87*	11.72*	22.04*	652*		185.6*	177.3*		1141*	47.50*	139*	.41
R^2	.08	.02	.00	.01	.00	.01	.01	.03	.01	.02	.06	.02	.02	.00
Personal Efficacy	**.13***	**.20***	**.08***	**.03**	**.08***	**.11***	**.21***	**.17***	**.18***	**.12***	**.21***	**-.17***	**.13***	**.15***
R^2	.01	.05	.01	.00	.01	.02	.04	.04	.03	.01	.04	.02	.01	.03
Collective Efficacy	**.20***	**.24***	**.01**	**-.04***	**.05**	**.11***	**.29***	**.12***	**.11***	**.15***	**.14***	**-.07**	**.08***	**.04**
R^2	.04	.07	.00	.00	.00	.02	.07	.02	.01	.02	.02	.01	.01	.00
Attendance	**-.21***	**.02**	**.10***	**.08***	**-.01**	**-.10***	**-.10***	**-.11***	**-.03**	**.05**	**-.14***	**-.30***	**.00**	**.04**
R^2	.04	.00	.00	.01	.00	.01	.01	.01	.00	.00	.01	.03	.00	.00
Age	**-.02***	**.00**	**-.01**	**.01***	**.00**	**-.01***	**-.03***	**-.03***	**-.01***	**-.01***	**-.02***	**.00**	**-.00**	**.00**
R^2	.04	.00	.00	.01	.00	.01	.05	.10	.00	.01	.03	.00	.00	.00
Sex	**.06**	**.01**	**-.03**	**.04**	**.06**	**.01**	**.09***	**.03**	**.05***	**.05**	**.18***	**.05**	**.03**	**-.03***
R^2	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.03	.00	.00	.00
Income	2.68*	.98	.79	.80	1.34	1.24	.29	.07	1.21	8.58*	1.49	4.48*	.27	.96
R^2	.02	.01	.00	.00	.01	.00	.00	.00	.00	.03	.01	.02	.00	.00
Education	**.27***	**-.00**	**.04**	**-.04**	**.02**	**.12***	**.06**	**.18***	**.07***	**-.03**	**.08***	**-.02***	**.09***	**.11***
R^2	.06	.00	.00	.00	.00	.02	.00	.04	.01	.00	.01	.00	.01	.01
R^2	KR	LT	NZ	NO	PH	RU	SK	SI	ZA	ES	SE	CH	TH	US
Political Ideology	1.33	.48	7.03*	9.10*	937.5*	3.06*	4.85*	5.48*	.50	19.91*	13.03*	43.81*	3.80*	111.9*
R^2	.00	.00	.09	.03	.00	.01	.02	.03	.00	.04	.03	.05	.01	.12
Postmaterialism	1.83	1.39	3.38	11.08*	3.60*	2.56	.01	8.68*	5.19*	6.27*	6.63*	9.34*	7.22*	.18
R^2	.00	.00	.00	.02	.01	.00	.00	.02	.01	.01	.01	.01	.01	.00
Religion	6.67*			119.7*		449.9*			290.1*	10.01*	5.97*	4.20*		750.2*
R^2	.02	.00	.02	.05	.00	.01	.01	.04	.00	.03	.01	.01	.00	.07
Personal Efficacy	**.17***	**-.01**	**.14***	**.16***	**.06**	**-.04**	**.08***	**.08***	**-.03**	**.17***	**.22***	**.23***	**-.03**	**.26***
R^2	.02	.00	.02	.03	.00	.00	.01	.01	.00	.03	.05	.05	.00	.05
Collective Efficacy	**.05**	**.08***	**.19***	**.18***	**.01**	**.08***	**.12***	**.13***	**.10***	**.12***	**.18***	**.18***	**.02**	**.29***
R^2	.00	.01	.03	.03	.00	.01	.02	.02	.01	.02	.04	.04	.00	.06
Attendance	**.05**	**.00**	**-.07**	**-.11***	**-.04**	**-.03**	**-.07**	**-.13***	**-.06**	**-.11***	**-.09***	**-.07***	**-.13***	**-.18***
R^2	.00	.00	.01	.01	.00	.00	.01	.02	.00	.01	.01	.01	.01	.03
Age	**-.01**	**-.01***	**-.02***	**-.02***	**.00**	**.00**	**-.01***	**.00**	**.00**	**-.00**	**-.02***	**-.01***	**-.00**	**-.01***
R^2	.00	.00	.03	.02	.00	.00	.01	.00	.00	.00	.04	.00	.00	.01
Sex	**-.02**	**.02**	**.19***	**.03**	**-.01**	**.01**	**.10***	**.12***	**-.04**	**.08***	**.12***	**.04***	**.00**	**.01**
R^2	.00	.00	.03	.00	.00	.00	.01	.01	.00	.01	.02	.00	.00	.00
Income	.37	1.42	5.14*	3.68*	1.60	.81	4.72*	1.10	1.19	1.49	4.99*	1.37	15.08*	1.04
R^2	.00	.00	.05	.01	.01	.00	.03	.00	.01	.00	.01	.00	.04	.00
Education	**.10***	**.04**	**.16***	**.23***	**.05**	**.00**	**.15***	**.07***	**.00**	**.04***	**.17***	**.11***	**.06***	**.17***
R^2	.01	.00	.03	.05	.00	.00	.02	.01	.00	.02	.04	.01	.05	.03

**<0.05 P-value.*

Table 9.7 – Bivariate analysis: world risk perception and independent variables

	T-Test ANOVA/**Spearman**/***Pearson***													
	AU	AT	CN	TW	HR	DK	FI	FR	DE	HU	IS	IN	IT	JP
Political Ideology	99.28*	2.59*		1.56	.64	13.71*	10.92*	7.55*	13.07*	5.39*	17.10*	.97	1.18	1.13
R^2	.12	.01		.00	.00	.06	.03	.03	.05	.02	.02	.01	.01	.00
Postmaterialism	.99	6.81*	1.96	3.04*	4.38*	3.88*	5.76*	19.52*	2.20	1.11	4.46*	2.45	3.47*	6.79*
R^2	.00	.02	.00	.00	.01	.01	.01	.04	.00	.00	.01	.01	.01	.01
Religion	8.75*	80.1*	83.9*	4.73*	34.96*	1631.5*			145.7*		1574.2*	30.52*	126.6*	.93
R^2	.06	.04	.00	.01	.00	.03	.03	.03	.01	.02	.07	.01	.02	.00
Personal Efficacy	**.16***	**.21***	**.08***	**.02**	**.13***	**.14***	**.22***	**.19***	**.25***	**.12***	**.21***	**-.18***	**.12***	**.19***
R^2	.02	.05	.01	.00	.02	.02	.06	.04	.07	.01	.04	.03	.02	.05
Collective Efficacy	**.18***	**.29***	**.00**	**-.03**	**.12***	**.15***	**.27***	**.14***	**.19***	**.22***	**.17***	**-.15***	**.06***	**-.00**
R^2	.03	.08	.00	.00	.01	.02	.07	.02	.03	.05	.02	.02	.00	.00
Attendance	**-.14***	**.04**	**.06**	**.05**	**-.00**	**-.12***	**-.11***	**-.12***	**-.04**	**.07**	**-.17***	**-.06**	**.00**	**-.01**
R^2	.02	.00	.00	.00	.00	.01	.01	.01	.00	.01	.02	.00	.00	.00
Age	***-.02****	***-.00***	***-.01***	***.01****	***.00***	***-.01****	***-.02****	***-.04****	***-.01****	***-.01***	***-.03****	***.01***	***-.00***	***-.00***
R^2	.05	.00	.00	.00	.00	.01	.03	.11	.02	.00	.04	.00	.00	.00
Sex	**.07**	**.04**	**-.03**	**.01**	**.03**	**-.00**	**.07***	**.03**	**.07***	**.05**	**11***	**-.01**	**.02**	**-.03**
R^2	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.01	.00	.00	.00
Income	3.74*	2.22	1.24	.61	1.13	3.90*	.34	.74	5.50*	5.47*	3.80*	3.59*	.03	2.03
R^2	.02	.01	.00	.00	.01	.01	.00	.00	.01	.02	.01	.02	.00	.01
Education	**.28***	**-.00**	**.04**	**-.02**	**.03**	**.22***	**.07***	**.21***	**.14***	**.01**	**.12***	**-.08***	**.09***	**.10***
R^2	.06	.00	.00	.00	.00	.04	.01	.05	.02	.00	.01	.01	.01	.01
	KR	LT	NZ	NO	PH	RU	SK	SI	ZA	ES	SE	CH	TH	US
Political Ideology	.87	2.65*	6.99*	9.22*	782.9*	3.78*	5.11*	6.41*	2.05	27.31*	14.33*	52.01*	1.93	141.4*
R^2	.00	.01	.08	.03	.01	.01	.02	.03	.01	.05	.04	.06	.01	.14
Postmaterialism	3.35*	.51	2.57	16.79*	2.05	3.88*	1.54	10.33*	2.38	3.08*	7.57*	12.82*	6.31*	.02
R^2	.01	.00	.04	.03	.00	.01	.01	.02	.00	.00	.01	.01	.01	.00
Religion	4.69*			111.9*		383.97*			293.3*	8.83*		5.16*		807.1*
R^2	.02	.01	.02	.07	.00	.01	.01	.03	.00	.03	.01	.01	.01	.07
Personal Efficacy	**.16***	**.07***	**.16***	**.16***	**.06**	**-.03**	**.16***	**.11***	**.00**	**.17***	**.20***	**.23***	**-.02**	**.25***
R^2	.02	.01	.02	.02	.00	.00	.03	.02	.00	.03	.04	.05	.00	.05
Collective Efficacy	**.00**	**.18***	**.20***	**.25***	**.03**	**.11***	**.20***	**.18***	**.08***	**.12***	**.20***	**.22***	**-.03**	**.26***
R^2	.00	.03	.04	.05	.00	.01	.04	.03	.01	.02	.03	.04	.00	.06
Attendance	**.05**	**-.03**	**-.11***	**-.12***	**-.13***	**-.01**	**-.00**	**-.18***	**-.06**	**-.11***	**-.13***	**-.10***	**-.08***	**-.18***
R^2	.00	.00	.01	.01	.01	.00	.00	.03	.00	.01	.02	.01	.00	.04
Age	***-.02***	***-.05***	***-.21****	***-.22****	***-.01***	***.06****	***-.09****	***-.03***	***.01***	***-.02***	***-.28****	***-.13****	***.00***	***-.15****
R^2	.00	.00	.04	.04	.00	.00	.01	.00	.00	.00	.07	.02	.00	.01
Sex	**-.02**	**-.00**	**.16***	**.02**	**.01**	**-.01**	**.07***	**.09***	**-.05**	**.10***	**.10***	**.06**	**-.01**	**.02**
R^2	.00	.00	.02	.00	.00	.00	.01	.01	.00	.01	.01	.00	.00	.00
Income	.73	1.36	3.70*	4.63*	2.61*	1.72	6.51*	.36	.25	1.24	9.57*	4.73*	13.16*	1.82
R^2	.00	.01	.05	.02	.01	.01	.04	.00	.00	.00	.02	.00	.04	.01
Education	**.06**	**.06***	**.20***	**.33***	**.08***	**-.02**	**.12***	**.13***	**-.06**	**.03**	**.22***	**.16***	**.03**	**.13***
R^2	.00	.00	.04	.09	.01	.00	.01	.02	.00	.00	.05	.02	.00	.02

9.8 Multivariate Linear Regression analysis for country risk perception

	AU	AT	CN	TW	HR	DK	FI	FR	DE	HU	IS	IN	IT	JP
Political Affiliation (Centre)														
Centre Left		.06		.22	-.49	-.35	.92	.49	.62	-.35	.78	.02	-.58	1.59
Left/Far Left	-1.24	.60				-.03		.06	.40		2.99	.21	-.86	.51
Centre Right	-1.51	.32		.74	-.44	-.93	.45	-.12	.01	-.57	-.13	.46	-1.13	.18
Right/ Far Right	-2.62	.08			-1.69	-.81		.25	-.99				-.57	.04
Refused/Didn't vote	-.54	-.16		.36	-.63	-.40	.69	-.05	.08	-.80	.51	.28	-.56	
Religion (No Religion)														
Catholic	-.37	.03	.30	-.35	.43	.22	.43	-.05	-.07	.69	-.32		-.93	
Protestant	-.45	.43	-.41	.06	1.57	-.06	.04	-.10	.03	.42	-.66	2.39	.96	
Orthodox	.00	-.86			.38		.43		.35	.24	-4.61		.57	
Other Christian (Varies by country)	-1.39	.46					-.16	-1.00	.48	-.51	-.37	-.17	-1.58	.03
Jewish	-.09				-.15	-4.79		.89	-1.52	.01				
Islamic	1.89	.49	.62	1.75	2.40	2.15	-.16	1.22	.37		-6.78	-.50	-1.66	
Buddhism	-3.71	-.39	.19	.39			-1.53	.04	-1.12		-1.94	-1.45	-1.51	.12
Hindu	-.04											-.54		
Attendance (Never)														
Once a month or less	-.37	.12	.23	.11	-.38	-.00	-.16	-.33	-.07	.05	-.17	-.44	.18	.05
More than once a month	-.20	-.38	.59	.57	-.31	-1.26	-.22	-.47	-.16	-.25	-.37	-1.26	.36	.61
Postmaterialism (Materialist)														
Postmaterialist	.50	-.59	.07	-.53	.10	.67	.08	.44	-.11	-.46	.15	-.61	.48	.61
Neither	.15	-.52	-.22	-.30	-.42	.22	.03	.03	.04	-.18	-.05	-.30	.13	.29
Constant	8.16	4.71	6.27	6.63	6.74	5.61	4.70	8.54	5.79	6.49	5.27	8.53	6.59	6.23
Adjusted R2	.30	.14	.06	.04	.05	.12	.18	.19	.08	.10	.18	.12	.06	.05
Observations	818	1139	2009	1638	895	780	909	1008	1382	861	767	1104	963	1138
	KR	**LT**	**NO**	**NZ**	**PH**	**RU**	**SK**	**SI**	**ZA**	**ES**	**SE**	**CH**	**TH**	**US**
Political Affiliation														
Centre Left	.81	.13	.51	-.22	-.13	.92	-.97	-.15	.59	-.18	.24	.43	.72	
Left/Far Left	1.58		.36			.88		.57	-.50	.18	.72	.08		
Centre Right	.106	.18	-.19	-1.17	-4.36	.44	-.42	-.30	.93	-.91	-.22	-.53	-.35	-1.45
Right/ Far Right	1.03			-1.95			-.51	-1.27	.74	-1.97	-.29	-1.01		
Refused/Didn't vote	.98	.09	.37	-.97	-.03	.73	-.41	-.28	-.02	-.42	.15	.10	.00	-.55
Religion (No Religion)														
Catholic	.70	-.10	-1.08	.26	.67	2.53		-.30	.19	-.21	-.05	.02		-.23
Protestant	.38	-1.33	-.52	-6.09	.87	1.70	.22	-.25	.09	-.02	.13	.04		-.62
Orthodox		-.30	-.41	1.07		.36	-.19	-.86		.82	-1.43	-.39		-1.49
Other Christian (Varies by country)		-.53	-.33	.21	.88		-.70	.72	.05	-.52	-.74	.35	-1.41	-.30
Jewish		2.48		1.86	-3.05	4.18	1.12		-.10	-.58		.48		-.14
Islamic			-.76	.83	.73	.39		-1.22	.02	-2.17	-1.12	-.51	.98	-1.02
Buddhism	-.35	-1.38	-.34	.23	-1.80	3.18		2.84	-3.71	.07	-1.23	.04	1.01	.18
Hindu			-1.88	.27			2.09	-5.69	.29	-5.36	1.93	-1.23	-2.04	.43
Attendance (Never)														
Once a month or less	.17	.02	-.01	-.15	.94	-.40	-.09	-.10	-.52	-.25	-.12	-.08	-.99	-.33
More than once a month	-.05	.13	-.05	-.95	-1.14	-.23	-.82	-.66	-.43	-.27	-.65	-.11	-1.49	-.68
Postmaterialism (Materialist)														
Postmaterialist	.31	-.48	.46	-.95	.49	.20	-.29	.32	-.73	.04	.39	.06	.83	.11
Neither	-.19	-.22	.10	.25	-.35	.30	-.10	.08	-.42	.08	.26	-.05	.14	.26
Constant	4.92	5.76	5.18	5.96	6.31	4.17	6.00	5.36	6.45	7.17	5.15	5.50	6.11	6.45
Adjusted R2	.05	.04	.13	.28	.03	.04	.10	.11	.05	.10	.14	.10	.11	.23
Observations	1069	980	882	766	1278	1302	744	904	1776	1754	1409	3601	1020	1379

9.9 – Multivariate linear regression analysis for world risk perception

	AU	AT	CN	TW	HR	DK	FI	FR	DE	HU	IS	IN	IT	JP
Political Affiliation (Centre)														
Centre Left		-.46		.07	-.37	-.78	.45	.36	.69	.06	.70	.36	-.48	.95
Left/Far Left	-.32	-.03				-.08		-.06	.50		1.75	.62	-.63	.22
Centre Right	-1.41	-.08		.40	-.60	-1.12	-.09	-.22	-.01	-.35	-.05	.28	-.67	-.04
Right/ Far Right	-2.81	.45			-1.23	-1.18		.03	-1.04				-.31	
Refused/Didn't vote	-.60	-.40		.17	-.60	-.48	.29	.00	.19	-.77	.47	.48	-.40	.03
Religion (No Religion)														
Catholic	-.25	.39	2.37	-.59	.07	.22	.70	-.00	.03	.88	-.71		.91	
Protestant	-.25	.71	.07	-.25	.58	-.29	-.19	.14	-.01	.93	-.77	1.15	.90	
Orthodox	.24	-1.37			-.42		-.21		-.03	-.23	-2.11		.36	
Other Christian (Varies by country)	-1.31	-.10					-.98	-.95	-.07	-.10	-.89	-.44	-1.85	.24
Jewish	1.30				-1.12	-7.40		.90	-1.05	.68				
Islamic	1.73	.67	.68	.22	2.60	2.57	-.97	1.27	.19		-8.16	-1.49	-2.18	
Buddhism	-3.48	1.80	.66	.18			1.21	-.02	-1.69		-2.09	-3.04	-1.06	.01
Hindu	.33											-1.58		
Attendance (Never)														
Once a month or less	-.37	.05	.03	.09	.04	.10	-.03	-.34	-.05	-.15	-.25	.94	.18	-.18
More than once a month	.14	-.37	-.14	.53	.06	-1.50	-.78	-.53	-.03	-.06	.19	.51	.29	.28
Postmaterialism (Materialist)														
Postmaterialist	.33	-.57	.25	-.56	.21	.67	.21	.53	.01	-.51	.37	-.84	.54	.71
Neither	.03	-.56	-.15	-.20	-.40	.28	.00	.05	.10	-.21	.22	-.20	.25	.48
Constant	7.99	5.51	6.45	7.47	6.75	6.96	6.34	8.60	5.90	5.90	6.93	8.77	6.80	5.93
Adjusted R2	.26	.16	.02	.02	.04	.18	.17	.19	.13	.11	.18	.11	.06	.07
Observations	817	1141	2001	1634	892	783	913	1017	1390	863	775	1107	962	1134
	KR	**LT**	**NO**	**NZ**	**PH**	**RU**	**SK**	**SI**	**ZA**	**ES**	**SE**	**CH**	**TH**	**US**
Political Affiliation														
Centre Left	.13	-.19	.22	-.85	-.38	.90	-1.10	.27	.75	-.07	.17	.38	.34	
Left/Far Left	.58		.07			.72		.72	-.37	.55	.48	.09		
Centre Right	.56	.11	-.30	-1.38	-4.70	.66	-.77	-.38	.86	-.83	-.29	-.62	-.46	-1.71
Right/ Far Right	.49			-2.69			-.69	-1.04	1.47	-1.85	-.62	-.75		
Refused/Didn't vote	.29	-.14	.26	-1.46	-.22	.83	-.57	-.34	.34	-.36	-.04	-.18	.20	-.53
Religion (No Religion)														
Catholic	.62	-.13	-.35	.53	.62	.15	.11	-.00	.40	-.09	.06	.05		-.22
Protestant	.29	-.49	-.50	-4.71	.88	1.22	-.13	-.12	.26	.46	.06	.11		-.46
Orthodox		-1.62	-.57	.84		.30	-.62	-.80		.55	-.76	-.44		-.43
Other Christian (Varies by country)		-.65	-.25	.35	.89		-1.93	.81	.10	-.34	-.79	.37	4.27	-.67
Jewish		3.54		1.26	-2.52	4.06			-.35	-.70		.14		.17
Islamic			-.05	.81	.97	.35		-.40	.29	-2.33	-.98	-.34	.85	-2.39
Buddhism	-.65	-2.00	.77	.28	-4.22	3.41	1.95	2.25	-3.52	.23	-1.77	.31	1.29	.40
Hindu			-1.58	.44				-1.40	.11	-5.15	1.42	-.03	-3.07	.56
Attendance (Never)														
Once a month or less	.47	-.06	-.12	-.68	-.87	-.33	.21	-.45	-.28	-.18	-.22	-.11	-.64	-.17
More than once a month	-.02	-.07	-.23	-1.13	-1.43	-.14	-.25	-1.02	-.26	-.50	-.74	-.28	-1.09	-.69
Postmaterialism (Materialist)														

Postmaterialist	.67	-.32	.54	-.80	.48	.02	.03	.34	-.33	-.13	.52	.15	.86	.07
Neither	-.15	-.10	-.08	.22	-.25	.41	.16	.13	-.17	.01	.46	-.04	.23	.14
Constant	5.60	6.14	6.31	7.36	5.76	4.39	5.83	6.17	5.84	7.02	7.05	6.56	5.70	6.31
Adjusted R2	.05	.07	.18	.27	.04	05	.11	.11	.05	.10	.17	.12	.10	.24
Observations	1067	988	874	766	1275	1306	766	918	1766	1771	1404	3615	1020	1388

Table 9.10 Full 2-level random intercept model for cross-level interaction between GDP and religious affiliation

	CR (M22)	WR (M26)
Religious Affiliation (No Religion)		
Catholic	2.79 (1.27)	3.75 (1.12)
Protestant	3.16 (1.40)	4.50 (1.56)
Orthodox	4.43 (1.23)	4.35* (1.14)
Other Christian	3.94 (1.40)	5.35 (1.52)
Jewish	-2.86 (6.71)	-.18 (7.07)
Islamic	4.55 (1.15)	4.89 (1.22)
Buddhist	3.47 (1.87)	5.20* (2.00)
Hindu	4.80 (1.38)	3.89(1.16)
Other Asian Religions	2.36 (2.40)	4.84 (1.87)
Other Religions	2.66 (1.91)	6.12 (1.80)
GDP (Log)	.37 (.13)	.65 (.11)
Religious Affiliation#GDP		
Catholic	-.27 (.12)	-.35 (.10)
Protestant	-.30 (.13)	-.43 (.15)
Orthodox	-.46 (.13)	-.45 (.12)
Other Christian	-.39 (.14)	-.53 (.15)
Jewish	.27 (.60)	.02 (.64)
Islamic	-.46 (.11)	-.50 (.12)
Buddhist	-.35 (.19)	-.49 (.20)
Hindu	-.47 (.17)	-.36 (.13)
Other Asian Religions	-.30 (.24)	.50 (.19)
Other Religions	-.22 (.18)	-.54 (.16)
Major Religion	.51 (.24)	.38 (.27)
Government Restriction	.04 (.12)	-.02 (.07)
Social Hostility	-.10 (.09)	.01 (.10)
Constant	2.11 (1.39)	-.50 (1.20)
Var (Constant)	.21 (.08)	.15 (.05)
Var (Residual)	4.78 (.24)	4.94 (.27)
Observations	34,305	34,353
ICC	.04	.03
S/B R-squared L1	.04	.07
S/B R-squared L2	.25	.51
AIC	128175.9	129280.1
BIC	128615	129719.2

Table 9.11 Full 2-level random intercept model for cross-level interaction between GDP and religious affiliation with added controls

	CR (M22)	WR (M26)
Religious Affiliation (No Religion)		
Catholic	2.83* (1.27)	3.52* (1.16)
Protestant	3.20* (1.48)	4.26* (1.63)
Orthodox	4.46* (1.20)	4.35* (1.21)
Other Christian	3.86* (1.44)	5.03* (1.55)
Jewish	-3.30 (6.60)	-1.08 (6.86)
Islamic	4.36* (.99)	4.25* (1.16)
Buddhist	2.36 (1.46)	4.32* (1.76)
Hindu	5.02* (1.15)	3.66* (1.13)
Other Asian Religions	.30 (2.18)	3.79* (1.75)
Other Religions	2.26 (1.30)	5.22* (1.31)
GDP (Log)	.61* (.12)	.78* (.12)
Religious Affiliation#GDP		
Catholic	-.27* (.12)	-.33* (.11)
Protestant	-.31* (.14)	-.40* (.16)
Orthodox	-.46* (.13)	-.45* (.12)
Other Christian	-.39* (.14)	-.50* (.15)
Jewish	.31 (.59)	.10 (.62)
Islamic	-.44* (.09)	-.42* (.11)
Buddhist	-.21 (.14)	-.39* (.17)
Hindu	-.49* (.14)	-.34* (.13)
Other Asian Religions	-.02 (.21)	-.36* (.17)
Other Religions	-.19 (.13)	-.46* (.12)
Government Restriction	.06 (.09)	.03 (.08)
Social Hostility	-.15 (.08)	-.06 (.10)
Emissions	-.13* (.04)	-.08* (.04)
CRI	-.01* (.00)	-.00 (.00)
CCPI	-.03* (.01)	-.01 (.01)
Constant	2.64* (1.21)	-.46 (1.31)
Var (Constant)	.28 (.04)	.35 (.04)
Var (Residual)	2.19 (.06)	2.22 (.06)
Observations	34,305	34,353
ICC	.02	.02
S/B R-squared L1	.06	.07
S/B R-squared L2	.61	.60
AIC	127870.1	129033.5
BIC		

Table 9.12 Logistic Multivariate models for Finland

	1	2
Political Affiliation		
2	-0.457	-0.294
	(0.312)	(0.369)
3	-0.259	0.138
	(0.294)	(0.393)
4	-0.345	-0.181
	(0.319)	(0.384)
5	0.920	1.786
	(0.391)	(0.767)
6	0.358	
	(0.425)	
7	-0.010	(0.579)
	(0.485)	-0.585
8	-1.216	(0.599)
	(0.539)	-0.427
Other	0.428	(0.829)
	(0.810)	0.160
Refused	-0.074	(0.334)
	(0.264)	
Religious Affiliation		
2. Protestant	-0.166	-0.127
	(0.197)	(0.263)
3. Orthodox	0.215	-0.560
	(0.797)	(0.886)
4. Other Christian	-0.102	-0.025
	(0.586)	(0.699)
10. Other Religions	-0.754	
	(1.515)	
Attendance of religious services		
Once a month or less	-0.126	0.101
	(0.195)	(0.261)
More than once a month	-0.312	-0.600
	(0.452)	(0.529)
Postmaterialism		
Postmaterialist	0.338	0.085
	(0.270)	(0.365)
Neither	0.122	-0.063
	(0.219)	(0.283)
Personal Efficacy	0.148	0.197
	(0.092)	(0.115)
Collective Efficacy	0.341	0.244
	(0.091)	(0.113)
Age of respondent	-0.028	-0.017
	(0.005)	(0.007)
Sex	0.132	-0.216
	(0.167)	(0.223)
Education		
Lower Secondary	0.089	0.730

	(0.298)	(0.417)
Post secondary/ short-cycle tertiary	0.261	-0.009
	(0.226)	(0.274)
Lower Tertiary	0.045	0.141
	(0.262)	(0.344)
Upper Tertiary	0.394	0.839
	(0.273)	(0.396)
PhD, Post-tertiary	0.722	1.139
	(0.645)	(1.097)
Income Quartiles		
2	0.378	0.079
	(0.239)	(0.304)
3	0.696	0.328
	(0.250)	(0.322)
4	0.093	-0.139
	(0.270)	(0.360)
5	0.261	0.087
	(0.294)	(0.368)
Intercept	-0.246	1.075
	(0.601)	(0.763)
Number of observations	902	856

Table 9.13 Logistic Multivariate models for Japan

	1	**2**
Political Affiliation		
2	-0.003	0.210
	(0.313)	(0.337)
3	-0.118	0.381
	(0.676)	(0.788)
4	-0.083	-0.244
	(0.469)	(0.469)
5	0.341	-0.232
	(0.522)	(0.452)
6	1.909	1.031
	(1.049)	(0.760)
Refused	0.136	0.207
	(0.215)	(0.223)
Religious Affiliation		
7. Buddhist	0.125	-0.035
	(0.212)	(0.214)
9. Other Asian Religions	-0.864	-0.187
	(0.439)	(0.576)
10. Other Religions	-0.565	-0.694
	(0.768)	(0.874)
Attendance of religious services		
Once a month or less	0.346	0.302
	(0.239)	(0.249)
More than once a month	0.544	0.419

	(0.462)	(0.493)
Postmaterialism		
Postmaterialist	0.641	0.914
	(0.377)	(0.380)
Neither	0.228	0.428
	(0.219)	(0.219)
Personal Efficacy	0.181	0.398
	(0.085)	(0.087)
Collective Efficacy	0.079	-0.108
	(0.084)	(0.089)
Age of respondent	0.011	0.009
	(0.006)	(0.006)
Sex	-0.096	0.166
	(0.185)	(0.190)
Education		
Lower Secondary	-0.230	-0.288
	(0.271)	(0.280)
Post secondary/ short-cycle tertiary	0.433	0.254
	(0.270)	(0.263)
Lower Tertiary	0.657	0.358
	(0.259)	(0.258)
Upper Tertiary	-0.365	0.473
	(0.594)	(0.788)
PhD, Post-tertiary	-0.186	-0.727
	(1.153)	(1.128)
Income Quartiles		
2	0.082	0.428
	(0.263)	(0.269)
3	0.112	0.382
	(0.270)	(0.270)
4	0.383	0.668
	(0.308)	(0.317)
5	-0.440	-0.032
	(0.320)	(0.337)
Intercept	-0.346	-1.064
	(0.556)	(0.592)
Number of observations	1061	1057

Table 9.14 Logistic Multivariate models for USA

	1	**2**
POLITICAL PARTY AFFILIATION		
not very strong democrat	-0.651	0.283
	(0.422)	(0.227)
independent, close to democrat	-0.164	0.363
	(0.409)	(0.233)
independent (neither, no response)	-0.200	0.755
	(0.332)	(0.232)
independent, close to republican	0.144	1.427
	(0.395)	(0.412)

not very strong republican	0.340	1.659
	(0.339)	(0.353)
strong republican	0.348	1.699
	(0.306)	(0.334)
other party	0.509	0.717
	(0.569)	(0.445)
1. Catholic	-0.505	-0.289
	(0.224)	(0.233)
2. Protestant	-0.610	-0.511
	(0.207)	(0.212)
3. Orthodox	-1.574	-1.048
	(0.648)	(0.617)
4. Other Christian	-0.583	-0.508
	(0.464)	(0.472)
5. Jewish	-0.361	-0.378
	(0.539)	(0.554)
6. Islamic	-0.916	-1.262
	(0.895)	(0.800)
7. Buddhist	0.628	
	(1.078)	
8. Hindu	0.067	0.727
	(0.832)	(1.094)
10. Other Religions	-0.174	-0.176
	(0.536)	(0.546)
RECODE of ATTEND (Attendance of religious services)		
Once a month or less	-0.114	0.087
	(0.190)	(0.195)
More than once a month	-0.176	-0.305
	(0.207)	(0.209)
RECODE of pm		
Postmaterialist	-0.052	-0.075
	(0.230)	(0.238)
Neither	-0.116	-0.208
	(0.202)	(0.209)
Q12a Too difficult to do much about environment	0.163	0.199
	(0.071)	(0.073)
Q12d No point unless others do the same	0.295	0.254
	(0.068)	(0.070)
Age of respondent	-0.007	-0.003
	(0.003)	(0.003)
RECODE of SEX (Sex of Respondent)	0.142	0.163
	(0.135)	(0.138)

RECODE of EDULEVEL (ISCED 2011 simplified: highest completed degree of education		
No Education, imcomplete Primary	-0.438	-0.375
	(0.455)	(0.470)
Primary	0.029	0.085
	(0.340)	(0.340)
Lower Secondary	0.680	0.715
	(0.563)	(0.561)
Post secondary/ short-cycle tertiary	-0.013	-0.046
	(0.226)	(0.226)
Lower Tertiary	0.146	0.232
	(0.171)	(0.176)
Upper Tertiary	0.906	0.828
	(0.252)	(0.258)
PhD, Post-tertiary	0.557	0.450
	(0.299)	(0.300)
Income Quartile		
2	-0.066	0.232
	(0.180)	(0.182)
3	0.179	0.426
	(0.219)	(0.223)
4	0.100	0.354
	(0.211)	(0.215)
5	-0.125	0.108
	(0.259)	(0.261)
Intercept	0.399	-0.062
	(0.883)	(0.368)
Number of observations	1255	1273

Table 9.15 2-Level Ordinal Random Intercept Models for Religion and Climate Change Risk Perception

	1	2
Political Affiliation		
Centre Left	0.135	0.124
	(0.049)	(0.053)
Left/ Far Left	0.424	0.411
	(0.089)	(0.098)
Centre Right	-0.359	-0.347
	(0.047)	(0.050)
Right/ Far right	-0.493	-0.413
	(0.076)	(0.080)
Refused/Didn't Vote	-0.077	-0.045
	(0.042)	(0.044)
Religious Affiliation		
1. Catholic	-0.054	0.069
	(0.045)	(0.048)
2. Protestant	-0.100	-0.089
	(0.044)	(0.048)
3. Orthodox	-0.259	-0.270
	(0.094)	(0.097)
4. Other Christian	-0.156	-0.174
	(0.079)	(0.082)
5. Jewish	0.123	-0.027
	(0.322)	(0.324)
6. Islamic	-0.242	-0.293
	(0.088)	(0.091)
7. Buddhist	0.131	0.115
	(0.081)	(0.085)
8. Hindu	0.214	0.209
	(0.130)	(0.133)
9. Other Asian Religions	-0.007	-0.044
	(0.115)	(0.128)
10. Other Religions	0.051	0.197
	(0.143)	(0.155)
Attendance of Religious Services		
Once a month or less	-0.058	-0.076
	(0.033)	(0.036)
More than once a month	-0.201	-0.219
	(0.045)	(0.047)
Postmaterialism		
Postmaterialist	0.091	0.076
	(0.045)	(0.048)
Neither	-0.082	-0.060
	(0.029)	(0.031)
Q12a Too difficult to do much about environment	0.086	0.074
	(0.012)	(0.013)

Q12d No point unless others do the same	0.129	0.162
	(0.011)	(0.012)
Age of respondent	-0.004	-0.004
	(0.001)	(0.001)
Sex	0.125	0.093
	(0.024)	(0.026)
Education		
No Education, imcomplete Primary	0.135	0.100
	(0.083)	(0.084)
Primary	0.065	0.001
	(0.057)	(0.058)
Lower Secondary	-0.057	-0.079
	(0.040)	(0.042)
Post secondary/ short-cycle tertiary	0.034	0.081
	(0.040)	(0.043)
Lower Tertiary	0.215	0.220
	(0.039)	(0.042)
Upper Tertiary	0.376	0.423
	(0.045)	(0.050)
PhD, Post-tertiary	0.678	0.782
	(0.119)	(0.140)
Income Quartiles		
2	0.028	0.130
	(0.035)	(0.037)
3	0.151	0.221
	(0.036)	(0.038)
4	0.154	0.278
	(0.039)	(0.041)
5	-0.036	0.016
	(0.044)	(0.046)
Log of GDP	0.176	0.343
	(0.095)	(0.092)
Majority Religion		
Eastern Religion	0.644	0.570
	(0.205)	(0.200)
Social Hostility	0.117	0.105
	(0.113)	(0.110)
Government Restriction	-0.173	-0.149
	(0.101)	(0.098)
Intercept	-1.736	-3.253
	(1.053)	(1.026)
lnsig2u	-1.935	-1.995
	(0.279)	(0.281)
sigma_u	0.380	0.369
	(0.053)	(0.052)
rho	0.042	0.040
	(0.011)	(0.011)
Number of observations	34305	34353

Table 9.16 2-Level Ordinal Random Intercept Models for Politics and Climate Change Risk Perception

	1	2	3	4
Political Affiliation				
Centre Left	0.136	0.124	-0.001	-0.038
	(0.049)	(0.053)	(0.095)	(0.099)
Left/ Far Left	0.422	0.409	0.302	0.109
	(0.089)	(0.098)	(0.208)	(0.213)
Centre Right	-0.359	-0.347	-0.155	-0.158
	(0.047)	(0.050)	(0.092)	(0.096)
Right/ Far right	-0.493	-0.413	-0.069	-0.178
	(0.076)	(0.080)	(0.149)	(0.153)
Refused/Didn't Vote	-0.079	-0.047	-0.056	-0.020
	(0.042)	(0.044)	(0.080)	(0.083)
Religious Affiliation				
1. Catholic	-0.056	0.067	-0.057	0.069
	(0.045)	(0.048)	(0.045)	(0.048)
2. Protestant	-0.100	-0.089	-0.098	-0.084
	(0.044)	(0.048)	(0.044)	(0.048)
3. Orthodox	-0.267	-0.278	-0.258	-0.266
	(0.094)	(0.097)	(0.094)	(0.097)
4. Other Christian	-0.151	-0.169	-0.150	-0.164
	(0.079)	(0.082)	(0.079)	(0.082)
5. Jewish	0.122	-0.027	0.116	-0.028
	(0.322)	(0.324)	(0.322)	(0.325)
6. Islamic	-0.241	-0.293	-0.236	-0.287
	(0.088)	(0.091)	(0.088)	(0.091)
7. Buddhist	0.133	0.117	0.127	0.114
	(0.081)	(0.085)	(0.081)	(0.085)
8. Hindu	0.219	0.212	0.223	0.218
	(0.130)	(0.133)	(0.130)	(0.133)
9. Other Asian Religions	-0.002	-0.039	-0.008	-0.045
	(0.115)	(0.128)	(0.115)	(0.128)
10. Other Religions	0.053	0.199	0.059	0.208
	(0.143)	(0.155)	(0.143)	(0.155)
Attendance of religious services				
Once a month or less	-0.057	-0.075	-0.055	-0.073
	(0.033)	(0.036)	(0.033)	(0.036)
More than once a month	-0.199	-0.216	-0.194	-0.213
	(0.045)	(0.047)	(0.045)	(0.047)
Postmaterialism				
Postmaterialist	0.091	0.076	0.289	0.326
	(0.045)	(0.048)	(0.120)	(0.128)
Neither	-0.082	-0.060	-0.051	-0.060
	(0.029)	(0.031)	(0.081)	(0.084)

Personal Efficacy	0.086	0.074	0.085	0.073
	(0.012)	(0.013)	(0.012)	(0.013)
Collective Efficacy	0.129	0.162	0.128	0.161
	(0.011)	(0.012)	(0.011)	(0.012)
Age of respondent	-0.004	-0.004	-0.004	-0.004
	(0.001)	(0.001)	(0.001)	(0.001)
Sex	0.125	0.093	0.124	0.092
	(0.024)	(0.026)	(0.024)	(0.026)
Education				
No Education, imcomplete Primary	0.136	0.100	0.134	0.101
	(0.083)	(0.084)	(0.083)	(0.084)
Primary	0.065	0.001	0.059	-0.002
	(0.057)	(0.058)	(0.057)	(0.058)
Lower Secondary	-0.057	-0.078	-0.059	-0.080
	(0.040)	(0.042)	(0.040)	(0.042)
Post secondary/ short-cycle tertiary	0.034	0.081	0.033	0.079
	(0.040)	(0.043)	(0.040)	(0.043)
Lower Tertiary	0.216	0.221	0.213	0.217
	(0.039)	(0.042)	(0.039)	(0.042)
Upper Tertiary	0.375	0.421	0.374	0.418
	(0.045)	(0.050)	(0.046)	(0.051)
PhD, Post-tertiary	0.678	0.783	0.674	0.777
	(0.119)	(0.140)	(0.119)	(0.140)
Income Quartiles				
2	0.028	0.129	0.025	0.127
	(0.035)	(0.037)	(0.035)	(0.037)
3	0.151	0.221	0.150	0.219
	(0.036)	(0.038)	(0.036)	(0.038)
4	0.153	0.278	0.153	0.277
	(0.039)	(0.041)	(0.039)	(0.041)
5	-0.037	0.016	-0.039	0.013
	(0.044)	(0.046)	(0.044)	(0.046)
GDP (log)	0.149	0.317	0.146	0.315
	(0.089)	(0.086)	(0.088)	(0.085)
Majority Religion				
Eastern Religion	0.550	0.486	0.551	0.492
	(0.205)	(0.198)	(0.204)	(0.196)
Political Aff. # Postmaterialism				
Centre Left # Postmaterialist			0.171	0.168
			(0.158)	(0.173)
Centre Left # Neither			0.183	0.233
			(0.107)	(0.113)
Left/ Far Left # Postmaterialist			0.045	0.250
			(0.286)	(0.312)

Left/ Far Left # Neither			0.154	0.383
			(0.235)	(0.246)
Centre Right # Postmaterialist			-0.578	-0.732
			(0.157)	(0.165)
Centre Right # Neither			-0.216	-0.167
			(0.103)	(0.108)
Right/ Far right # Postmaterialist			-1.253	-0.848
			(0.261)	(0.269)
Right/ Far right # Neither			-0.449	-0.228
			(0.170)	(0.175)
Refused/Didn't Vote # Postmaterialist			-0.174	-0.247
			(0.136)	(0.145)
Refused/Didn't Vote # Neither			0.001	0.005
			(0.091)	(0.094)
Intercept	-1.478	-3.005	-1.482	-3.006
	(0.937)	(0.903)	(0.931)	(0.895)
lnsig2u	-1.826	-1.910	-1.844	-1.935
	(0.278)	(0.280)	(0.278)	(0.280)
sigma_u	0.401	0.385	0.398	0.380
	(0.056)	(0.054)	(0.055)	(0.053)
rho	0.047	0.043	0.046	0.042
	(0.012)	(0.012)	(0.012)	(0.011)
Number of observations	34305	34353	34305	34353