

Attitudes and Behaviours Regarding Climate Change Activism

Kathleen C. Whitson

*This thesis is submitted in partial fulfilment of the Honours degree of Bachelor of
Psychological Science (Honours)*

School of Psychology

Faculty of Health and Medical Sciences

University of Adelaide

October 2020

Word Count: 9,019

Table of Contents

List of Figures.....	6
List of Tables	7
Abstract.....	8
Declaration.....	9
Contribution Statement.....	10
Acknowledgements.....	11
1. Introduction.....	12
1.1 Anthropogenic Climate Change and Collective Action.....	12
1.2 Climate Change Segmentation Analyses.....	13
1.3 Climate Change Activism.....	15
1.3.1 Political Participation.....	16
1.3.2 Financial Activism: Divestment and Boycotts.....	16
1.3.3 Non-violent Climate Change Protests.....	18
1.3.4 Engagement with a Social Movement Organisation (SMO).....	19
1.3.5 Social/Online Activism.....	20
1.3.6 Motivators for and Barriers to Climate Change Activism.....	22
1.4 The Current Study and Research Aims.....	23
2. Method.....	24
2.1 Participants.....	24
2.2 Materials.....	25
2.2.1 Demographics.....	25
2.2.2 The Six Americas screening scale.....	26
2.2.3 The Climate Change Activist Behaviour (CCAB) Scale.....	26

2.2.4 Motivators for and Barriers to Activism Behaviours.....	28
2.3 Procedure.....	28
2.3.1 Pilot Study.....	28
2.3.2 Main Data Collection.....	28
2.3.3 Ethics.....	29
2.3.4 Reflexivity.....	29
2.4 Data Analysis.....	29
2.4.1 Predictive Validity Analysis of the CCAB Scale.....	29
2.4.2 Aim One: Latent Class Analysis and Probability of Engaging in Activism Behaviours.....	30
2.4.3 Aim Two: Demographic Predictors of Class Membership	30
2.4.4 Aim Three: Motivators for and Barriers to Activism Behaviours	30
3. Results.....	31
3.1 Segmentation Analysis.....	31
3.2 Aim One: Latent Class Analysis and Probability of Engaging in Activism Behaviours.....	32
3.3 Aim Two: Demographic Predictors of Class Membership.....	34
3.4 Aim Three: Motivators for and Barriers to Activism Behaviours.....	36
3.4.1 Motivators for Engaging in Behaviours in the CCAB Scale.....	36
3.4.2 Barriers to Engaging in Behaviours in the CCAB Scale.....	37
3.4.3 Most-cited Motivators and Barriers.....	38
3.4.4 Qualitative Descriptions of “Other” Barriers.....	42
4. Discussion.....	44
4.1 Overview and Summary of Findings.....	44
4.2 Interpretation of Results and Comparisons with Past Research.....	45

4.2.1 Aim One: Latent Class Analysis and Probability of Engaging in Activism Behaviours.....	45
4.2.2 Aim Two: Demographic Predictors of Class Membership.....	46
4.2.3 Aim Three: Motivators for and Barriers to Activism Behaviours.....	47
4.3 Implications and Recommendations.....	48
4.3.1 Political Participation.....	49
4.3.2 Financial Activism.....	50
4.3.3 Social/Online Activism.....	50
4.3.4 Non-violent Protests	51
4.3.5 Engagement with a SMO.....	51
4.4 Limitations and Future Research.....	52
4.5 Conclusion.....	53
5. References.....	55
6. Appendices.....	62
Appendix A: Six Americas Segmentation Scale.....	62
Appendix B: Table B.2 <i>Predictive Validity Analysis</i>	66
Appendix C: Table C.3 <i>Odds Ratios of Probability of Engagement in Each Activist Behaviour, Across Classes</i>	67
Appendix D: <i>Figure D.4</i> Distributions of motivators with response patterns for six activism behaviours (f – k) across classes.....	69
Appendix E: <i>Figure E.5</i> Distributions of motivators with response patterns for six activism behaviours (l - r) across classes.....	70
Appendix F: <i>Figure F.6</i> Distributions of barriers with response patterns for six activism behaviours (f - k) across classes.....	71

Appendix G: <i>Figure G.7</i> Distributions of barriers with response patterns for six activism behaviours (l - r) across classes.....	72
--	----

List of Figures

<i>Figure 1.</i> Additional variables created using data from the ABS and ATO websites: Inferred SES, proximity to bushfire-affected areas, and rural-urban place of residence.....	26
<i>Figure 2.</i> Probability of engaging in climate change activism behaviours across three latent classes, grouped by behaviour type.....	34
<i>Figure 3.</i> Distributions of motivators with unique response patterns for five activism behaviours (a - e) across classes.....	40
<i>Figure 4.</i> Distributions of barriers with unique response patterns for five activism behaviours (a - e) across classes.....	41

List of Tables

Table 1 <i>Climate Change Segments Identified in Hine et al.'s (2013) Research Using Segmentation Analysis</i>	14
Table 2 <i>List of Items in the CCAB Scale Grouped by Behaviour Type</i>	27
Table 3 <i>Demographics of the Total Sample, Composed of Participants in the Alarmed and Dismissive Segments</i>	31
Table 4 <i>Model Fit Statistics Comparing Class Solutions</i>	32
Table 5 <i>Latent Classes Within the CCAB Scale</i>	33
Table 6 <i>Demographics of the Alarmed Participants Across Classes</i>	35
Table 7 <i>Results of a Multinomial Logistic Regression Predicting the Probability of Class Membership as a Function of Demographic Variables</i>	36
Table 8 <i>Comparisons Made by two Independent Raters of Motivator and Barrier Distributions for Engaging in Behaviours in the CCAB Scale</i>	39
Table 9 <i>Qualitative Comments From 'Other' Text Boxes, Highlighting Reasons for not Engaging in SMO Behaviours and Financial Activism Behaviours</i>	42

Abstract

Past research suggests non-violent activism is an effective strategy for populations to increase pressure on governments and bring about policy change. Yet, little is currently known about the motivators for and barriers to climate change activism in Australia. A quantitative-dominant, concurrent mixed methods design was used to investigate this gap in knowledge. Participants ($N = 531$) completed an online survey consisting of two climate change scales; an attitude scale and a behaviour scale. Latent class analysis (LCA) was used to determine if underlying classes were present in the behaviour scale, while a multinomial logistic regression (MLR) was conducted to determine predictors of class membership. Finally, a multiple response analysis (MRA) was used to analyse respondents' reasons for engaging, or not engaging, in the activism behaviours. Results from the LCA suggested the presence of three classes: Least Active (22.9%), Moderately Active (55.3%), and Most Active (21.8%). The Most Active class had the highest probability of engagement in climate change activism behaviours compared to the Least and Moderately Active classes. Results from the MLR suggested age was a significant predictor of class membership. Compared to the Least Active respondents, the Most and Moderately Active respondents were significantly older. Results from the MRA suggest, generally, the Most and Moderately Active classes cited similar motivators, while the Least and Moderately Active classes cited similar barriers. These findings have implications for climate change communicators. Information addressing motivators and barriers of climate change activism could help to increase public engagement with anthropogenic climate change.

Keywords: anthropogenic climate change, climate change activism

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

Signed

October 13, 2020

Contribution Statement

In writing this thesis, both my supervisors and I collaborated to generate three research aims and design the methodology to investigate these aims. I completed the ethics application, literature search, the activist behaviour survey in Qualtrics, the recruitment of survey respondents, data collection, creation of all tables and figures, and the final write-up of the thesis. My co-supervisor organised the qualitative comments from the open-ended text boxes so that I could select some quotes to be included in Table 9, while my principle supervisor organised the audience segmentation syntax from the Six Americas survey. She also created three extra demographics variables using data from the Australian Bureau of Statistics and the Australian Taxation Office. My principle supervisor conducted the latent class analysis and multinomial logistic regression in MPlus Version 8.3, while I conducted the predictive validity analysis of the activist behaviour survey and multiple response analysis of respondents' tick box survey responses in SPSS Version 27. I was also responsible for interpreting the results of the latent class analysis and multinomial logistic regression.

Acknowledgements

I would really like to acknowledge the support and guidance from Dr Peta Callaghan and Dr Anastasia Ejova. Their expertise in research is truly inspiring and their generosity of time and positivity helped to make this year a year of in-depth learning and development. I would also like to thank my partner and two children for their belief in my abilities. I have cherished their unwavering support and understanding. Finally, research cannot be conducted without respondents willing to give up their time to complete surveys. To all 531 survey respondents, thank you.

1. Introduction

1.1 Anthropogenic Climate Change and Collective Action

Anthropogenic, or human-caused climate change has been identified as one of the most pressing issues facing humanity. Earth's Global Mean Surface Temperature is projected to increase by two or more degrees Celsius by 2100 without systemic change and a mass reduction in global greenhouse gas (GHG) emissions (Pachauri et al., 2014). The scientific theory of anthropogenic climate change (ACC) is based on the premise that humans and their activities are responsible for the increasing rate of GHG emissions since the Industrial Revolution (Masson-Delmotte et al., 2018). Globally, GHG emissions have been linked to the following major sectors: electricity production, transport, buildings, industry, agriculture, forestry, and other land use (Pachauri et al., 2014). To reduce the harmful effects of ACC, the Intergovernmental Panel on Climate Change (IPCC) has recommended mass global policy change in these major sectors (Masson-Delmotte et al., 2018).

To bring about these changes in policy, non-violent resistance from the public has been identified as an effective way for populations to increase pressure on governments and bring about systemic change (Stephan & Chenoweth, 2008). Based on data from 1900 to 2006, Stephan and Chenoweth (2008) investigated 323 historical examples of public resistance. Examples included the Rose Revolution in Georgia in 2003, the Singing Revolution in Estonia in 1991, and the People Power movement protesting the Marcos regime in the Philippines in 1986. Stephan and Chenoweth's research suggested that for systemic change to occur, approximately 3.5% of a population needed to actively engage in nonviolent resistance. If this tipping point was reached, systemic change occurred 53% of the time, more than twice the occurrence of violent campaigns, including war. Stephan and Chenoweth's (2008) results suggest that a relatively small percentage of the population is required to engage in nonviolent resistance so that systemic change can occur and lead to the

reduction of global GHG emissions. Yet little is known why people who are alarmed about climate change engage in nonviolent resistance. Based on previous research on climate change attitudes (Leiserowitz et al., 2019; Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011), this study aims to investigate climate change activism behaviours of people who self-identify as alarmed. Additionally, this study will examine the perceived motivators of and barriers to climate change activism behaviours.

1.2 Climate Change Segmentation Analyses

A segmentation analysis is a tool used extensively in public health communication initiatives (Slater, 1996). First, a population is segmented into groups of people based on similar attitudes, motives, beliefs, or behaviours. Once segmented, interventions or messages can target distinct groups, with the objective of changing behaviour for the benefit of society (Hine et al., 2013; Slater, 1996). Examples include drug abuse prevention (Palmgreen & Donohew, 2006), smoking prevention (Flynn et al., 2007), and the promotion of pro-environmental behaviours (DEFRA, 2008). Recently, segmentation analysis has been used to identify distinct groups of people who differ according to their attitudes towards anthropogenic climate change (Ashworth, Jeanneret, Gardner, & Shaw, 2011; Hine et al., 2013; Leiserowitz et al., 2019). Findings from the Six Americas climate change segmentation research project in the United States (US) suggested the presence of six segments: Alarmed, Concerned, Cautious, Disengaged, Doubtful, and Dismissive (Leiserowitz et al., 2020; Leiserowitz et al., 2019). In an Australian context, Hine et al. (2013) conducted climate change segmentation research on a large national sample ($N = 3,096$). Their findings suggested the existence of five Australian climate change segments (refer to Table 1).

Table 1

Climate Change Segments Identified in Hine et al.'s (2013) Research Using Segmentation Analysis

Audience segment	Percentage of sample	Description
Alarmed	26%	Respondents reported high levels of belief in anthropogenic climate change; high levels of behavioural adaptation to climate change; and intent to support clean energy policies, compared to other segments.
Concerned	39%	Participants believed anthropogenic climate change was occurring; reported above average levels of concern, distress, perceived risk, and trust in climate change authorities; but were less engaged and active than the Alarmed group.
Uncertain	14%	Participants tended to believe anthropogenic climate change was occurring, however, they reported lower than average levels of concern, risk perceptions, and trust in scientific authorities.
Doubtful	12%	Respondents in this segment self-reported low levels of belief in anthropogenic climate change and were generally disengaged from the issue.
Dismissive	9%	These respondents did not believe anthropogenic climate change was occurring and self-reported low levels of distress, concern, and perceived risks associated with climate change.

Note. $N = 3,096$

Additional Australian climate change segmentation research has suggested the existence of the same six segments observed in the Six Americas research (Morrison, Parton, & Hine, 2018). Data collected in 2016 ($N = 2,503$) and 2011 ($N = 1,927$) indicated relatively stable membership in the Concerned segment (approximately 30% of each sample). However, slight increases of segment membership were noted in the Alarmed (17.5% in 2016, up from

15% in 2011), Cautious (21.6% up from 18.2%), and Disengaged segments (11.1% versus 8.6%). In contrast, segment membership in the Doubtful and Dismissive groups slightly decreased (i.e., 16.9% versus 13.1% and 10.7% versus 6.5%, respectively) (Morrison et al., 2018). Ashworth, Jeanneret, Gardner, and Shaw (2011) also conducted similar research and found the following four segments in an Australian sample ($N = 1,602$): Engaged (27%), Concerned and Confused (36%), Disengaged (15%), and Doubtful (23%).

Both Leiserowitz et al. (2020) and Hine et al.'s (2013) research indicated most participants were in the Alarmed and Concerned segments. Alarmed participants engaged more in personal behavioural responses aimed at reducing their carbon footprint, and supported more climate change mitigation policies, compared to participants in the other segments. Compared to Concerned participants, Alarmed participants were more likely to engage in activism to bring about change at the societal and political level. In contrast, Doherty and Webler's (2016) research specifically focused on the effects of social norms and efficacy beliefs in a US Alarmed segment. In a sample from Vermont, Doherty and Webler (2016)'s results suggested the presence of two Alarmed subsegments. These subsegments were labelled More Active and Less Active (i.e., the More Active group engaged in more examples of climate change activism, compared to the Less Active group). In line with Doherty and Webler's (2016) research, the current study also focuses on the Alarmed segment, but in an Australian sample.

1.3 Climate Change Activism

The following sections aim to highlight different forms of climate change activism. Five behaviour types will be covered: Political Participation; Financial Activism; Non-violent Protests; Engagement with a Social Movement Organisation (SMO); and Social/Online Activism. The final section will discuss motivators for and barriers to climate change activism.

1.3.1 Political participation. Research from the Six Americas project investigated Americans' perceptions of climate change activism, their beliefs surrounding the efficacy of climate change activism, and their intentions to engage in future instances of activism behaviour (Leiserowitz et al., 2019). Approximately one third of the Americans surveyed believed politicians were influenced by climate change activism (i.e., signing petitions, protest marches, calling/emailing politicians), while only 3% reported personal participation in campaigns designed to lobby politicians for more climate change action (Leiserowitz et al., 2019). From an Australian perspective, Hine et al.'s (2013) research investigated participants' support for policies aimed at mitigating climate change. Specifically, they measured participants' voting intentions with regards to differing energy policies (i.e., the construction of new coal-fired power stations versus wind farms). Additionally, Hine et al. (2013) also measured whether survey participants thought taxes should be spent on carbon emission reduction strategies. Results from their study suggested Alarmed participants would support both options. Hine et al.'s (2013) research addresses voting behaviour, but not other political participatory behaviours such as engagement with elected representatives. To build upon this research, the current study will focus on three Political Participation behaviours: meeting, calling, and writing to a politician.

1.3.2 Financial activism: Divestment and boycotts. The climate change divestment movement has been described as a transnational advocacy network designed to encourage investors to renounce fossil fuel stocks (Ayling & Gunningham, 2017). Divestment, however, is not a new form of climate change activism. Ayling and Gunningham (2017) emphasized the prevalence of divestment in climate change campaigns dating back to the early 1990s. The most recent manifestation of the climate change divestment movement began in 2012, after Bill McKibben, an American environmental activist and founder of 350.org, wrote a renowned article titled, 'Global Warming's Terrifying New Math' (Ayling & Gunningham,

2017). Since its inception, the Fossil Free divestment campaign has claimed responsibility for the overall divestment of \$US14.61 trillion, 1,244 institutions divesting their fossil fuel stocks, and 58,000 individuals divesting approximately \$US5.2 billion from the fossil fuel industry (Fossil Free Divestment, 2020).

One of the main aims of the divestment movement is to bring about a rapid societal and economic shift in line with the energy revolution put forward by the International Energy Agency (Ayling & Gunningham, 2017). The movement initially focused on pressuring American universities to divest fossil fuel stocks and then spread to other areas such as faith-based organisations, health institutions, non-governmental organisations, foundations, and municipal bodies. Ayling and Gunningham (2017) critique the divestment movement for its lack of target-setting and monitoring functions. Instead, they suggest the movement's goal is to stigmatise the fossil fuel industry and focus on the immorality of investing in an industry that is adversely affecting Earth's atmosphere.

On the other hand, boycotts are defined as an individual or collective refusal to spend money on services or products to change practices of corporations, institutions, or organisations (Delacote, 2009; Pezzullo, 2011). Australian climate change segmentation research suggested Alarmed participants were more likely than Dismissive participants to boycott companies that were not reducing carbon emissions (Morrison et al., 2018). Furthermore, a declining trend for boycotts was evident across the Concerned, Cautious, Disengaged, and Doubtful segments. Morrison et al.'s (2018) research specifically measured participants' boycotting behaviours, however, there was no reference to divestment behaviour. The current study will therefore add to the existing body of knowledge regarding boycotts and will also investigate the divestment behaviours of Alarmed Australians. Specifically, four Financial Activism behaviours will be measured: boycotting carbon-

intensive corporations, and divesting from a bank, superannuation fund, or insurance company.

1.3.3 Non-violent climate change protests. The School Strike for Climate social movement began when Greta Thunberg, a Swedish teenage environmental activist, started striking from school in August 2018 (McKnight, 2020). Since then, millions of school students have protested global governments' lack of action on anthropogenic climate change (Boulianne, Lalancette, & Ilkiw, 2020). On March 15, 2019, it is estimated 1.4 million students and supportive adults protested globally to demand more effective climate change action from global governments (Boulianne et al., 2020). More global climate strikes occurred three days prior to the United Nations (UN) Climate Change Summit in New York on September 20, 2019 (Esposito, 2019). Protest organisers in Australia estimated 300,000 Australian School Strikers and supportive adults protested on this day in what has been described as one of the largest mass protests in Australian history (Esposito, 2019). The Australian School Strikers' demands of the Australian Federal Government were threefold: No new coal, gas, or oil developments; a fair transition for all fossil fuel workers; and 100% renewable energy by 2030 (School Strike for Climate Australia, 2020).

Climate change protests have, however, come from meagre beginnings (Rootes, 2012). Rootes highlights how environmental protests, not specifically climate change protests, increased in frequency in the United Kingdom (UK) from 1988 to 1998. No specific examples of climate change protests, however, were reported in the UK prior to 2000 (Price, 2011, as cited in Rootes, 2012). Since then, climate change protests in the UK have increased in frequency and number of participants. In response to the breakdown of negotiations at the 2000 UN Climate Conference, the environmental group, Campaign against Climate Change, began to organise climate change protests (Rootes, 2012). These protests attracted small numbers of participants until the International Day of Climate Protest in December of 2005,

which drew crowds of 10,000 protesters. Larger protests were organised when the Campaign against Climate Change and the Stop Climate Chaos organisations formed a coalition (Rootes, 2012). In 2006, the climate change protest in Trafalgar Square attracted 30,000 protesters, while in London, 40,000 people protested in the lead-up to the 2009 UN Climate Conference (Rootes, 2012). McKnight (2020) and Rootes' (2012) research cover the historical proliferation of climate change protests, however, there is no mention of specific behaviours from protest participants. The current study will therefore investigate four protest behaviours of Alarmed Australians: attending a protest, helping to organise a protest, encouraging friends and family to attend a protest, and putting up a poster to help promote a protest.

1.3.4 Engagement with a Social Movement Organisation (SMO). Sturmer and Simon (2004) defined a SMO as a group of people working together to achieve collective action goals. Sturmer and Simon (2004) investigated various examples of SMO identification: The Grey Panthers elderly people's movement in Germany and the gay movement in the US. First, they hypothesised identification with the Grey Panthers would predict intentions to participate in a social movement, compared to the broader social category of 'the elderly'. Second, they hypothesised that identification with the gay movement in the US would also predict intentions to participate in the gay social movement. Results confirmed their hypotheses: Identification with both SMOs significantly predicted willingness to engage in each social movement (Stürmer & Simon, 2004).

In terms of the current climate change social movement, engagement and identification with an environmental advocacy group could be compared to identification with a SMO. Accordingly, the current study aims to investigate whether Alarmed Australians have engaged with an environmental SMO, specifically, have Alarmed Australians donated, volunteered, attended face-to-face training sessions, or online meetings with environmental

SMOs. For the purposes of this study, an environmental SMO will be defined as an environmental advocacy group that is focused on increasing action on climate change.

Examples include, but are not limited to, the Australian Conservation Foundation, Doctors for the Environment, the Wilderness Society, Greenpeace, Australian Parents for Climate Action, and School Strike for Climate.

1.3.5 Social/online activism. Slacktivism, Dennis (2019) suggests, is a concept of importance in his continuum of political participation. Using the Oxford English Dictionary definition, Dennis (2019) describes slacktivism as an Internet action carried out to support a social or political cause. Furthermore, slacktivism requires little time, commitment, or effort, and includes activities such as signing online petitions, participating in online mass-email campaigns, and sharing social media posts. Dennis' (2019) political participation continuum views participation, not as an outcome, but as a process consisting of four stages (i.e., the Access, Expressions, Connection, and Action stages). First, the Access stage refers to how citizens cognitively engage with political and social issues. Examples include how citizens pay attention to social media posts shared by acquaintances and how opinion formulation occurs. Second, the Expression stage describes the types of communication between citizens and includes interpersonal discussions of political or social issues and face-to-face contact with elected representatives. Third, the Connection stage refers to how citizens organise themselves and includes behaviours such as becoming members of organisations. Finally, the Action stage refers to goal-orientated acts such as signing a petition, boycotting, protesting, voting, volunteering, or donating to a cause, and other advocacy behaviours. These indicators, Dennis (2019) suggests, are not prescriptive, but rather fluid (i.e., some indicators might simultaneously belong to two stages, depending on citizens' goals).

Critics of slacktivism argue that examples of low-effort, online forms of activism have little political impact (Morozov, 2011). Refuting slacktivist critics, Dennis postulates

slacktivism to be essential across all four stages of the continuum and usually dependent on the political or social movement groups' goals. For instance, American researchers surveyed 169 individuals from 53 social movement groups and found these groups modified their social media tactics to suit certain campaign goals (Obar, Zube, & Lampe, 2012). In an example from the UK, Twitter was used in both the mobilising and protest stages, during the 2010 university occupations against government cuts to the tertiary sector (Theocharis, 2012). In the mobilising stage, Twitter was used to disseminate information to wider audiences about upcoming protests, while in the protesting stage, organisers used Twitter to co-ordinate activists in real-time on the days of university occupations (Theocharis, 2012). In contrast, Udlam (2013) suggested engagement in climate change activism could be viewed along a reformist versus radical activism continuum. Reformist strategies have attempted to influence policies of existing political structures and may include online collective actions such as 'twitter storms' and online petitions (Udlam, 2013). Conversely, radical climate change activists view existing political structures as illegitimate and have focused on systemic change instead (Udlam, 2013). Udlam suggested online activism facilitated reformist climate change activism, while real-time civil disobedience is more suited to radical activism.

Research from Fowler and Christakis' (2010) social network analyses of cooperative behaviour suggest interpersonal influences reached up to three degrees of separation (i.e., from person A, to person B, to person C, to person D). Findings from their experimental studies suggest cooperative behaviour cascades in social networks (Fowler & Christakis, 2010). Similarly, Bond et al. (2010) conducted a randomised controlled trial of online political mobilisation messages during the 2010 US elections. Political mobilisation messages were disseminated to 61 million US Facebook users, who were in turn, randomly assigned to one of three groups: a control group ($n = 613,096$), an informational message group ($n =$

611,044), or a social message group ($n = 60,055,176$). Facebook users in the informational message group were shown a message that promoted voting, provided an informational link to polling locations, presented an 'I Voted' badge for the user to click, and displayed a tracker highlighting how many US Facebook users had self-reported voting. The social message group was exposed to all the conditions mentioned above, as well as six randomly chosen Facebook friends' profile pictures who had also clicked on the 'I Voted' badge. No message was displayed to the control group. Results from Bond et al.'s (2010) study suggested the political mobilisation messages directly affected information-seeking (i.e., indicated by clicking on the polling location link); political self-expression (i.e., measured by users self-reported voting behaviour, which was in turn made visible to their Facebook friends' list); and real-time voting behaviour (i.e., ascertained by cross-referencing public voting registers with 6.3 million Facebook users 'I Voted' self-reports). To build upon the notion of ripple effects in face-to-face and online social networks, the current study will focus on three social/online examples of climate change activism: sharing a social media post, signing an online petition, and speaking with friends and family about the need for climate change action.

1.3.6 Motivators for and barriers to climate change activism. Historical research has focused on motivators for collective action and include an individual's sense of self-, collective-, and political-efficacy (Doherty & Webler, 2016; Van Zomeren, Postmes, & Spears, 2008), intergroup emotions (Mackie, Devos, & Smith, 2000; Smith, 1993), and a sense of collective- and politicised-identity (Simon & Klandermans, 2001; Simon et al., 1998). The current study aims to build upon this past research and will focus on the roles of efficacy, emotion, and other day-to-day motivators for engaging in climate change activism.

Research from the UK suggested many barriers have been responsible for the climate change attitude-behaviour gap (Ockwell, Whitmarsh, & O'Neill, 2009). Ockwell et al. (2009)

suggested barriers existed at both the societal and individual level. At the societal level, barriers included a lack of enabling initiatives (i.e., unaffordable and infrequent public transport); consumeristic social norms (i.e., conspicuous consumption habits in order to keep up appearances); lack of political, corporate, and industrial action; and concern about the ‘free-rider effect’ (i.e., why should I take action when no other person or country is taking action) (Ockwell et al., 2009). Conversely, individual barriers to climate change action may include a fatalism attitude (i.e., it is too late to effect change); scepticism or denial; the spatial and temporal proximity issue of climate change (i.e., climate change is a future problem that will affect people in other countries); loss aversion (i.e., reluctance to change personal lifestyle choices); and lack of knowledge. In line with Ockwell et al.’s (2009) research focusing on individual barriers, this study will focus on the individual day-to-day barriers people may face when it comes to engaging in Political Participation, Financial Activism, Non-violent Protests, Engagement with a SMO, and Social/Online Activism.

1.4 The Current Study and Research Aims

The current study aims to add to the existing body of knowledge regarding climate change segmentation research. In line with Doherty and Webler’s (2016) research on Alarmed subsegments, this study specifically focuses on the Alarmed segment in an Australian sample. More precisely, what climate change activism behaviours Alarmed Australians have engaged in and why. Information from this study may be beneficial in addressing the barriers to and motivators for climate change activism behaviour. In addition, knowledge gained from the current study may prove useful in mobilising more of the public to demand effective climate change mitigation policies from Australian Local, State, and Federal Governments. Consequently, the research aims for the current study are as follows:

1. To determine which activism behaviours Alarmed Australians have engaged in and whether there were unique classes of respondents with differing probabilities of engaging in each behaviour.
2. To determine whether there was a difference in engagement, across classes, dependent on age, gender, rural or urban place of residence, socio-economic status (inferred by Socio Economic Indexes for Areas (SEIFA)), and/or proximity to bushfire-affected areas.
3. To ascertain, across classes, the barriers to and motivators for these climate change activism behaviours.

2. Method

2.1 Participants

The sample ($N = 531$) consisted largely of participants recruited from five Facebook groups associated with climate change activism: the Australian Parents for Climate Action (AP4CA) public page ($n = 38$); the AP4CA private group ($n = 108$); Federal Minister Zali Steggall's public page ($n = 217$); the 100% Renewables SA public page ($n = 28$); and the 2040 private group ($n = 110$). The sample sizes associated with each Facebook group are indicative only, since some Facebook respondents shared the survey link. A small subgroup of respondents ($n = 30$) was recruited from the University of Adelaide (UoA) first-year Psychology student pool.

The total sample consisted of 410 females, 116 males, an individual who identified as non-binary, and four individuals who preferred not to state their gender. Participants' ages ranged from 17 to 62 years ($M = 46.28$; $SD = 14.16$). Further sample demographics can be found in Table 3 in the Results.

Twelve participants expressed attitudes that placed them into the Dismissive segment, according to American norms. Since we were interested in activism behaviour among people

in the Alarmed segment, Dismissive participants were excluded from all analyses except the validation of the study's activism behaviour scale (see Materials and Data Analysis below).

2.2 Materials

Participants were invited to complete a survey in Qualtrics that included four sections: demographics, an attitude-based segmentation scale, a scale that measured climate change activism behaviours, and a section that allowed participants to select motivators for and barriers to activism behaviours.

2.2.1 Demographics. Participants were asked to indicate their age in years, gender (1 = female, 2 = male, 3 = non-binary, 4 = prefer not to say), and postcode. To facilitate the granting of course credits to UoA Psychology students, Research Participation System and UoA identification numbers were also collected from the student sample. Participants' postcode details were then used to create three further variables. The inferred socio-economic status (SES) variable was created using Socio Economic Index for Areas (SEIFA) data from the Australian Bureau of Statistics (ABS) (ABS, 2020). The bushfire-affected variable was created using Australian Taxation Office (ATO) data on tax-exempt postcode areas following the 2019/2020 bushfire season (ATO, 2020). Finally, the rural-urban variable was created using ABS data that classified postcodes as either rural or urban (ABS, 2017; refer to Figure 1).

The inclusion of extra variables was considered necessary considering past research investigating climate change attitudes, SES (Hine et al., 2013; Morrison et al., 2018), and rural-urban place of residence (Morrison et al., 2018). The possible effects of bushfire-induced trauma, depression, increased alcohol use, and anxiety have also been well-documented, justifying the inclusion of the bushfire-affected variable (Newnham, Titov, & McEvoy, 2020; Bryant et al., 2018).

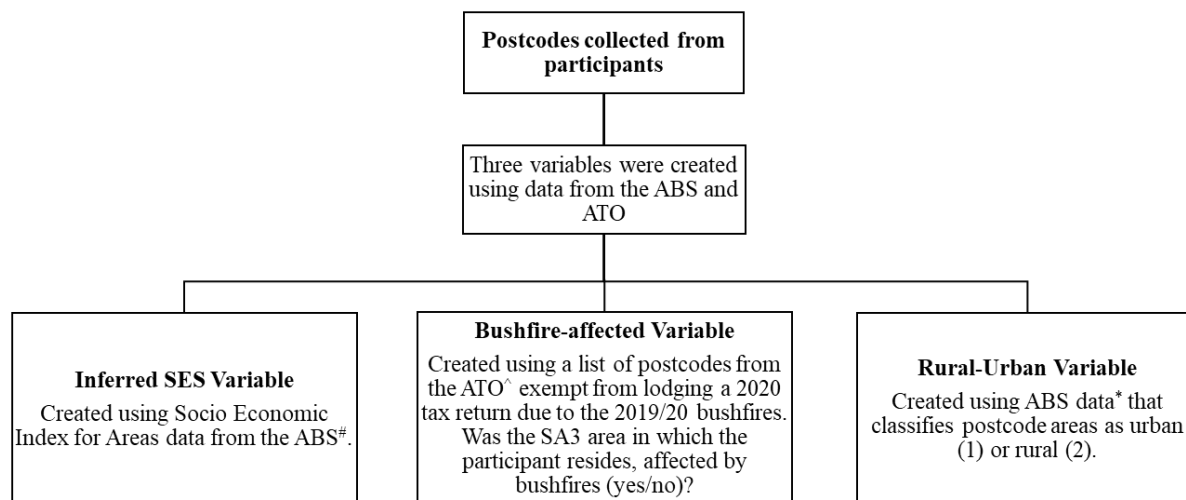


Figure 1. Additional variables created using data from the ABS and ATO websites: inferred SES, proximity to bushfire-affected areas, and rural-urban place of residence.

Indicates SEIFA data from the ABS website, used to infer the SES of participants
http://stat.data.abs.gov.au/Index.aspx?DataSetCode=SEIFA_POA

^ List of ATO postcodes affected by the 2019-20 bushfires
<https://www.ato.gov.au/General/Dealing-with-disasters/In-detail/Specific-disasters/Bushfires-2019-20/?anchor=Postcodesidentifiedfordeferral#Postcodesidentifiedfordeferral>

* ABS data that classifies postcode areas as urban or rural
<https://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.004>

2.2.2 The Six Americas screening scale. The 15-item Six Americas scale, presented in Appendix A, was used to ensure all participants in the main analysis belonged to a segment of the population that would be classified in the US as Alarmed (Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011). To demonstrate predictive validity, the scale developers used regression analyses to determine if segment membership predicted support for carbon emission reduction policies. Results supported their hypothesis (Maibach et al., 2011). Syntax for the segmentation analysis, with American norms, was available in the scale manual (Maibach, Leiserowitz, Roser-Renouf, Mertz, & Akerlof, 2011).

2.2.3 The Climate Change Activist Behaviour (CCAB) scale. The CCAB scale, a scale that measured whether respondents had engaged in 18 activism behaviours in the past,

was adapted from the Activism Orientation Scale (Corning & Myers, 2002). The adaptation was necessary because the Activism Orientation Scale was a measure of intentions, rather than actual behaviours, and was quite specific to an American context. The CCAB scale, described fully in Table 2, enquired about multiple types of climate change activism behaviours described in the Introduction: Political Participation, Financial Activism, Non-violent Protests, Engagement with a SMO, and Social/Online Activism.

Table 2

List of Items in the CCAB Scale Grouped by Behaviour Type

Activist behaviour
Political participation
In the past, have you:
Met with a political representative to request more action on human-induced climate change?
Called a political representative to ask for more action on climate change?
Sent a letter and/or email to a political representative, requesting more action on human-induced climate change?
Financial activism
Changed an insurance policy to an insurance company that does not finance fossil fuels?
Divested money from a bank that is known to finance fossil fuels?
Moved your superannuation to a superannuation fund that does not finance fossil fuel corporations?
Boycotted a company or corporation because of its negative effects on Earth's climate systems?
Non-violent protests
Helped to organise a climate change protest?
Put up a poster promoting a climate change protest?
Encouraged friends and/or family to attend a climate change protest?
Attended a climate change protest?
SMO engagement
Attended an environmental group training session focused on bringing about change at a societal level?
Attended an online meeting, organised by an environmental advocacy group, that focused on increasing action on climate change?
Volunteered time with an environmental advocacy group that is focused on increasing action on climate change?
Donated money to an environmental advocacy group that is focused on increasing action on climate change?
Social/online activism
Shared a social media post about more action on climate change?
Spoken with family and/or friends about the need for more action on climate change?
Signed an online petition asking for more action on climate change?

2.2.4. Motivators for and barriers to activism behaviours. In Qualtrics, skip logic was added to the list of 18 activism behaviours in the CCAB scale. If participants had engaged in any of the behaviours in the past, they were prompted to select any of seven motivators for engaging in the behaviour/s. Motivator options included ‘quick activity’, ‘had time’, ‘important activity’, ‘effective activity’, ‘felt comfortable’, ‘had experience’, or ‘other’. If participants selected ‘other’, they were prompted to write their motivation for engaging in the behaviour in a text box. Participants who had not engaged in activism behaviours were prompted to select any of seven barriers: ‘work commitments’, ‘did not have time’, ‘family commitments’, ‘did not have experience’, ‘felt uncomfortable’, ‘not effective’, or ‘other’. Similarly, participants were invited to write the barriers for not engaging in the behaviours in a text box.

2.3 Procedure

2.3.1 Pilot study. In a pilot study of the survey, first-year UoA Psychology students were invited to complete the survey via the SONA Research Participation System, in return for course credit (SONA Systems, 2020). Students were included in the study if they met inclusion criteria (i.e., were an Australian resident and 17 years or older). Data collected from these participants were included in the main data analysis because the Six Americas segmentation scale was functioning as intended. Moreover, it was deemed useful to include a cohort of younger participants in the sample, given the strong momentum of the recent School Strike for Climate protests and more general concern about climate change among young people (McKnight, 2020; O'brien, Selboe, & Hayward, 2018).

2.3.2 Main data collection. Permission was sought to post a survey invite and link in eight Facebook pages hypothesised to contain Alarmed Australians. The five groups

mentioned above granted permission, while the Coalition for Conservation, the UoA main page, and the UoA student group page declined.

2.3.3. Ethics. The study was approved by the Ethics Committee at the University of Adelaide's School of Psychology (Approval number: 20/41).

2.3.3. Reflexivity. I self-identify as Alarmed. Since 2019, I have been a member of the AP4CA Facebook group (7500 members nationwide). Together with my partner and other Adelaide parents, we helped to set up the Adelaide AP4CA Facebook group (230 members). We participate in numerous types of collective action: financial activism, engaging with politicians, online activism, native Australian seedling grow groups with *Trees for Life SA*, and more.

2.4 Data Analysis

2.4.1 Predictive validity analysis of the CCAB scale. To validate the CCAB scale, Chi-square tests of independence were conducted for each behaviour in *SPSS* Version 27. Responses from the 12 Dismissive and 12 randomly selected Alarmed participants were analysed, then repeated with a second group of 12 randomly selected Alarmed participants (refer to Appendix Table B.2). Results suggested a significant relationship between being in the Alarmed segment and probability of enacting the behaviour, for 12 out of the 18 behaviours in the CCAB scale. The behaviours for which the probability of participation did not differ across Alarmed and Dismissive participants, were behaviours that had low engagement even among Alarmed participants: meeting and calling a politician, divesting an insurance policy, helping to organise a protest, and attending an environmental group training session or online meeting (refer to Figure 2 in Results). Overall, we found evidence for the predictive validity of the CCAB scale in distinguishing between Alarmed and Dismissive participants, with respect to the probability of engaging in activism behaviour.

2.4.2 Aim one: Latent class analysis and probability of engaging in activism behaviours. To determine if there were unique classes of respondents with differing probabilities of engaging in each behaviour, data from the remaining 519 Alarmed participants were used to conduct a multi-stage latent class analysis in *MPlus* Version 8.3 (Asparouhov & Muthén, 2014). With a sample size of 519 participants, this study was deemed to have sufficient power (Asparouhov & Muthén, 2014).

2.4.3 Aim two: Demographic predictors of class membership. To determine if demographic variables predicted behavioural class membership, a multinomial logistic regression was conducted in *MPlus* Version 8.3, as part of the multi-stage latent class analysis (Vermunt, 2010).

2.4.4 Aim three: Motivators for and barriers to activism behaviours. Participants could select any number of the seven motivators and barriers for each behaviour in the CCAB scale. Therefore, to determine the motivators for and barriers to these behaviours, a multiple response analysis was conducted in *SPSS* Version 27. Based on the qualitative ratings of two independent raters, distributions of the frequency for which motivators and barriers were cited, were rated as either similar or different for each possible pair of latent classes (i.e., whenever 20 or more participants reported the barrier or motivator). The raters agreed on 89.28% of comparisons for motivators and 86.67% of comparisons for barriers. Differences between raters were then resolved (refer to Table 8 in Results).

This study was a quantitative-dominant, concurrent mixed methods study. A full qualitative analysis was not carried out on qualitative data collected from the CCAB scale; however, some qualitative comments will be included to clarify participants' reasons for engaging, or not engaging, in behaviours from the CCAB scale. The option of triangulating findings from both the quantitative and qualitative data collected in this study will be

considered in the Discussion as a possible future avenue of research (O’Cathain, Murphy, & Nicholl, 2010).

3. Results

3.1 Segmentation Analysis

Results from the Six Americas segmentation survey suggested the vast majority ($n = 519$; 97.74%) of participants fell into the Alarmed climate change attitude segment, while a small minority ($n = 12$; 0.02%) fell into the Dismissive segment. Sample demographics for the total sample and both segments are presented in Table 3. Respondents had a mean age of 46.3 years, were mostly female and urban-dwelling. Regarding socio-economic status (SES), participants were just above the SEIFA mean, and within half a standard deviation.

Approximately 25% resided within bushfire-affected areas.

Table 3

Demographics of the Total Sample, Composed of Participants in the Alarmed and Dismissive Segments

Demographic predictors	Total sample ($n = 531$)	Alarmed ($n = 519$)	Dismissive* ($n = 12$)
Age (years)			
<i>M</i>	46.28	46.20	49.58
<i>SD</i>	14.16	14.24	9.99
Gender (%)			
Female	77.2	78.0	41.7
Male	21.8	21.2	50.0
Non-binary	0.2	0.2	0
Prefer not to say	0.8	0.6	8.3
SIEFA			
<i>M</i>	1033.31	1033.46	1027.25
<i>SD</i>	76.64	77.00	61.92
<i>missing n</i>	5	5	0
Proximity to bushfires (%)			
Resides within affected areas	25.6	25.4	33.3
Resides outside affected areas	74.0	74.2	66.7
<i>missing n</i>	2	2	0
Urban vs rural residents (%)			
Urban	86.6	86.5	91.7
Rural	12.4	12.5	8.3
<i>missing n</i>	5	5	.

Note. *Dismissive participants were excluded from further analyses.

3.2 Aim One: Latent Class Analysis and Probability of Engaging in Activism Behaviours

A latent class analysis was conducted to determine if there were discernible classes of Alarmed respondents with differing probabilities of engagement in various activism behaviours. Results suggested the presence of three unique classes. Model fit statistics for solutions with different numbers of classes are presented in Table 4. The three-class solution was retained because it had the lowest BIC and AIC values, compared to solutions with a lower and higher number of classes.

Table 4

Model Fit Statistics Comparing Class Solutions

Class solutions	AIC	aBIC	BIC
1 class	9926.50	9945.90	10003.04
2 classes	8539.22	8579.10	8696.54
3 classes	8194.24	8254.59	8432.35
4 classes	8140.13	8220.96	8459.02

Note. AIC = Akaike Information Criterion. aBIC = Sample-size adjusted Bayesian Information Criterion. BIC = Bayesian Information Criterion. Retained three-class solution in bold.

Table 5 shows the size of the classes within the three-class solution, based on model estimates of the most likely class for each participant. Figure 2 shows the probability of engaging in each activist behaviour across classes, with behaviours grouped according to behaviour types discussed in the Introduction. It can be seen in Table 5 that the Moderately Active class was the largest class, incorporating 55% of participants. Both other classes, which can be termed Least Active and Most Active, each incorporated approximately 22% of participants (i.e., Classes 1 and 3, respectively, in Table 5 and Figure 2).

As the ‘a’ superscripts in Figure 2 indicate, the probability of engagement was higher among the Most Active participants compared to both other classes, and among Moderately Active participants compared to the Least Active class for all but five behaviours: meeting a politician, divesting an insurance policy, putting up a protest poster, sharing a social media post, and speaking to family and friends. The latter two behaviours, denoted by ‘c’, comprise two of the three Social/Online Activism behaviour types. The probability of participation in these two behaviours were equivalent across the Moderately and Most Active classes, while still being lower among the Least Active class. The ‘b’ superscript in Figure 2 indicates that for two behaviours — meeting a politician and putting up a protest poster — significant differences were evident across all class pairs, except for the Moderately and Least Active classes. Conversely, the ‘d’ superscript indicates significant pairwise differences between only the Most and Moderately Active class for one behaviour: divesting an insurance policy (refer to Appendix Table C.3 for a table of the odds ratios showing the probability of engagement for each activist behaviour, between class pairs).

Table 5

Latent Classes Within the CCAB Scale

Latent class	Class label	Participants per class	Percentage in each class
1	Least Active	119	22.9
2	Moderately Active	287	55.3
3	Most Active	113	21.8
	Total	519	

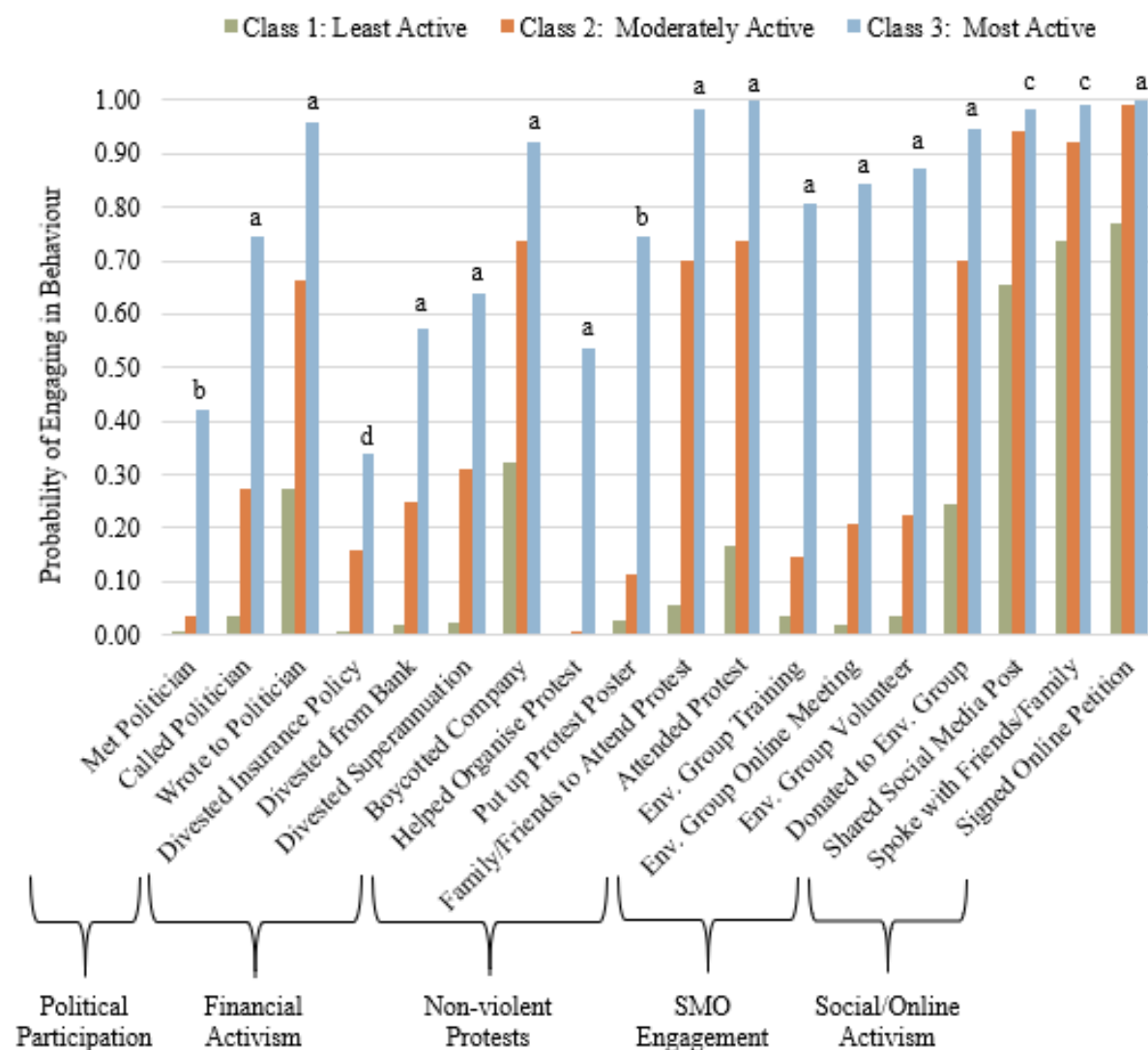


Figure 2. Probability of engaging in climate change activism behaviours across three latent classes, grouped by behaviour type (i.e., ‘Political Participation’, ‘Financial Activism’, etc.). The letter superscripts denote which classes differed significantly in probability of engagement for each individual behaviour: *a* denotes a significant pairwise difference in behaviour engagement probability across all three classes; *b* denotes significant pairwise differences across all but the Moderately and Least Active classes; *c* denotes significant pairwise differences across all but the Moderately and Most Active classes; and *d* denotes a significant pairwise difference across the Most and Moderately Active classes only. Env. = Environmental; SMO = Social Movement Organisation. Complete results presented in Appendix Table C.3.

3.3 Aim Two: Demographic Predictors of Class Membership

To identify the demographic predictors of latent class membership, a multinomial logistic regression was conducted. Demographic descriptive statistics for the three classes are

reported in Table 6 and the results of the multinomial logistic regression are presented in Table 7. As can be seen in Table 7, age was the only significant predictor of class membership. Relative to respondents in the Least Active (Class 1), respondents in both other classes were significantly older. No other demographic factors predicted class membership.

Table 6

Demographics of the Alarmed Participants Across Classes

Demographic predictors	Alarmed segment		
	Class 1 Least Active (<i>n</i> = 119)	Class 2 Moderately Active (<i>n</i> = 287)	Class 3 Most Active (<i>n</i> = 113)
Age (years)			
<i>M</i>	42.81	46.83	48.19
<i>SD</i>	17.44	13.28	12.25
Gender (%)			
Female	73.1	79.4	79.6
Male	26.1	20.2	18.6
Non-binary	.	.	0.9
Prefer not to say	0.8	0.3	0.9
SIEFA			
<i>M</i>	1032.65	1033.13	1035.15
<i>SD</i>	80.49	75.39	77.94
<i>missing n</i>	1	2	2
Proximity to bushfires (%)			
Resides within affected areas	26.1	25.1	25.7
Resides outside affected areas	73.1	74.9	73.5
<i>missing n</i>	1	.	1
Urban vs rural residents (%)			
Urban	84.9	88.5	83.2
Rural	14.3	10.8	15.0
<i>missing n</i>	1	2	2

Table 7

Results of a Multinomial Logistic Regression Predicting the Probability of Class Membership as a Function of Demographic Variables

Demographic variables	Class 3 vs 1			Class 2 vs 1		
	Most Active (relative to Least Active)			Moderately Active (relative to Least Active)		
	OR	SE	95% CI	OR	SE	95% CI
Gender ^a	0.558	0.196	[0.280, 1.111]	0.615	0.193	[0.333, 1.135]
Age	1.037	0.012	[1.014, 1.061]*	1.030	0.012	[1.007, 1.054]*
SEIFA	1.000	0.002	[0.996, 1.005]	0.999	0.002	[0.996, 1.003]
Proximity to bushfires ^b	0.904	0.320	[0.452, 1.808]	0.890	0.284	[0.476, 1.665]
Place of residence ^c	0.940	0.385	[0.421, 2.096]	0.569	0.224	[0.263, 1.229]

Note. *If the CI around the odds ratio does not include 1, the predictor variable significantly predicted class membership, $p < .05$. SEIFA = inferred socio-economic status. ^aGender (0 = female; 1 = male). ^bProximity to bushfires (0 = resides outside affected areas; 1 = resides in affected areas). ^cPlace of residence (0 = urban; 1 = rural).

3.4 Aim Three: Motivators and Barriers of Activism Behaviours

A multiple response analysis was conducted to interpret participants' motivations and barriers for engaging, or not engaging, in activism behaviours. Two independent raters evaluated whether the distributions of motivators and barriers were similar or different (refer to Method). As discussed in the Data Analysis section, differences and similarities in response patterns are important for SMOs to be aware of: Recommendations, aimed at decreasing barriers and increasing motivators, could be made, resulting in a possible increase in engagement across classes (i.e., especially in the Least and Moderately Active classes).

3.4.1 Motivators for engaging in behaviours in the CCAB scale. Table 8 shows four unique response patterns for engaging in behaviours in the CCAB scale. First, and reinforcing the findings highlighted in Figure 2, is the overall low engagement from the Least Active class for most behaviours (i.e., cells with less than or equal to 20 responses indicate low engagement and were left blank). Second, the Most and Moderately Active classes cited

similar motivators for engaging in 15 of the 18 behaviours, except for meeting a politician, helping to organise a protest, and putting up a protest poster. Third, compared to the Most and Moderately Active classes, the Least Active class cited different motivators for writing to a politician, donating to an environmental group, and speaking with friends and family about climate change action. Finally, similar motivators were cited across classes for engaging in three behaviours: boycotting a company, sharing a social media post, and signing an online petition. Figure 3 shows example behaviours with unique patterns of responses (bolded in Table 8): wrote to a politician (Figure 3a); boycotted a company (Figure 3b); putting up a protest poster (Figure 3c); donating to an environmental group (Figure 3d); and speaking with family and friends about the need for more action on climate change (Figure 3e). Refer to Appendices D and E for remaining motivator graphs.

3.4.2 Barriers for not engaging in behaviours in the CCAB scale. Four unique response patterns are also evident in the barrier section of Table 8. First, the Moderately and Least Active classes cited similar barriers for 14 of the 18 activism behaviours. Exceptions include attending a protest and all three Social/Online Activism behaviours. Second, similar barriers were cited across all class pairs for four activism behaviours (i.e., meeting a politician, divesting an insurance policy, divesting from a bank, and helping to organise a protest). Third, compared to the Moderately and Least active classes, the Most Active class cited different barriers for three activism behaviours: calling a politician, divesting superannuation, and putting up a protest poster. Finally, compared to the Moderately and Least Active classes, the Most Active classes cited few barriers for 11 activism behaviours (i.e., blank cells indicate high engagement from the Most Active class). Figure 4 highlights five example behaviours (bolded in Table 8): called a politician (Figure 4a); divested from a bank (Figure 4b); divested superannuation (Figure 4c); attended a protest (Figure 4d); and

attended an environmental group online meeting (Figure 4e). Remaining barrier graphs can be found in Appendices F and G.

3.4.3 Most-cited motivators and barriers. Regarding motivators, for nearly all 18 behaviours, ‘important activity’ and ‘effective activity’ were the two most-cited motivators across classes. Notable exceptions were two of the Social/Online Activism behaviours — signing an online petition and sharing a social media post — where ‘quick’ was the most-cited motivator across classes. Regarding barriers, ‘time-poor’, ‘no experience’, and ‘other’ were the three most-cited responses for all four Financial Activism behaviours, while across SMO behaviours, ‘time-poor’ and ‘other’ were prominent response patterns. Finally, across classes, ‘felt uncomfortable’ was the most-cited barrier for calling a politician and encouraging family or friends to attend a protest.

Table 8

Comparisons Made by two Independent Raters of Motivator and Barrier Distributions for Engaging in Behaviours in the CCAB Scale

	Motivators			Barriers		
	Class 3 vs 1	Class 2 vs 1	Class 3 vs 2	Class 3 vs 1	Class 2 vs 1	Class 3 vs 2
Activist behaviour	Most vs Least Active	Moderately vs Least Active	Most vs Moderately Active	Most vs Least Active	Moderately vs Least Active	Most vs Moderately Active
Political participation						
Met politician				S	S	S
Called politician			S	^D	S	^D
Wrote to politician	D	D	S		S	
Financial activism						
Divested insurance policy			S	S	S	S
Divested from bank			S	S	S	S
Divested superannuation			S	^D	S	^D
Boycotted company	S	S	S		S	
Non-violent protests						
Helped organise protest				S	S	S
Put up protest poster			^D	D	S	D
Encouraged family/friends to attend protest			S		S	
Attended protest			S		D	
SMO engagement						
Environmental group training			S		S	
Environmental group online meeting			S		S	
Environmental group volunteer			S		S	
Donated to environmental group	D	D	S		S	
Social/online activism						
Shared social media post	S	S	S			
Spoke with friends/family	^D	^D	S		D	
Signed online petition	S	S	S			

Note. Blank cells indicate number of responses were ≤ 20 and were therefore excluded from the analysis. S = similar response patterns between classes. D = differing response patterns between classes. Unique response patterns are in bold and highlighted in *Figure 3 and Figure 4*. ^Indicates resolved differences between the two independent raters. Motivator rates of agreement: 25 out of 28 comparisons were the same, indicating a comparison rate between raters of 89.28%. Barrier rates of agreement: 26 out of 30 comparisons were the same, indicating a comparison rate between raters of 86.7%.

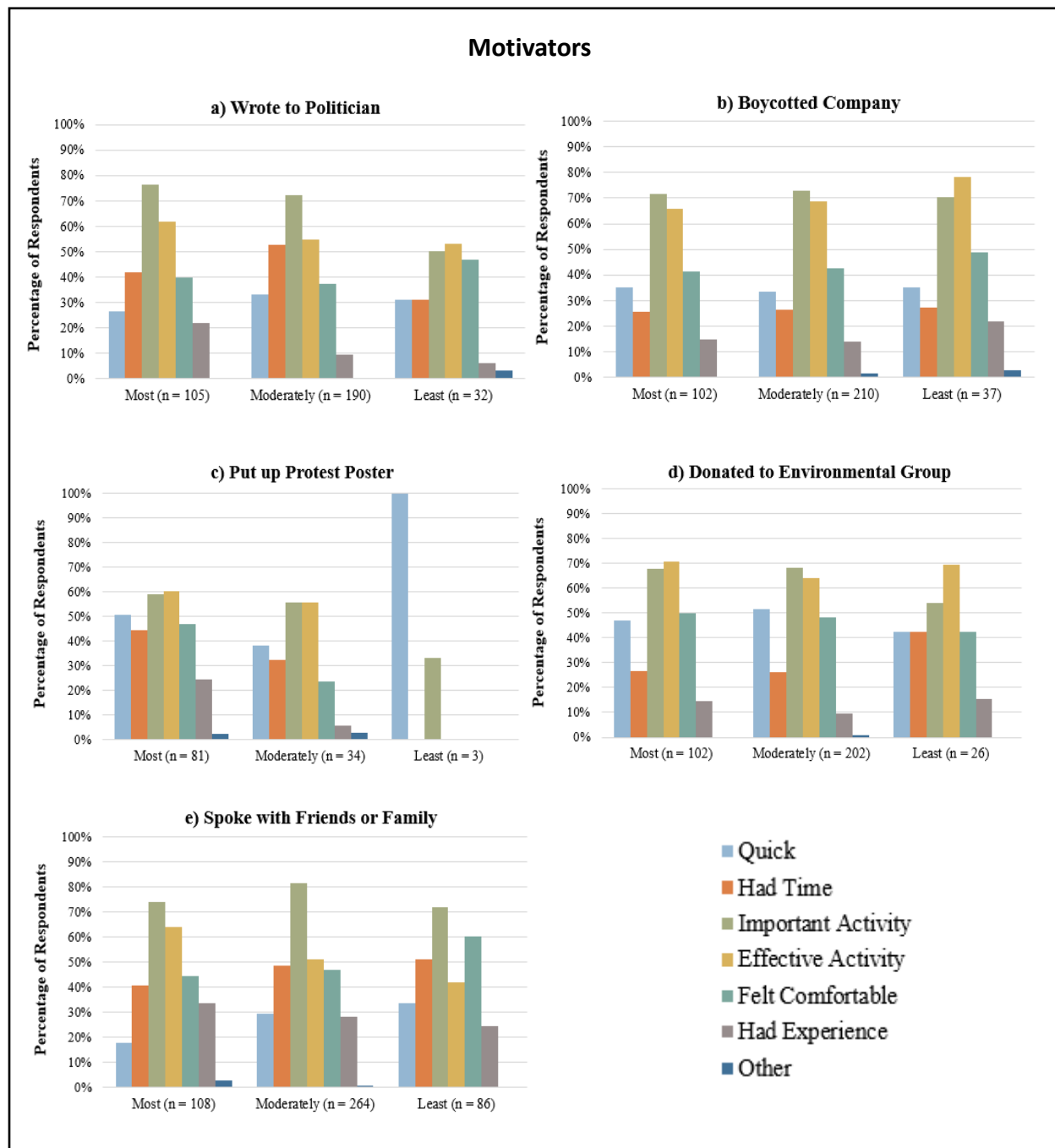


Figure 3. Distributions of motivators with unique response patterns for five activism behaviours: (a) wrote to a politician; (b) boycotted a company; (c) put up a protest poster; (d) donated to an environmental group; and (e) spoke with friends or family regarding climate change action.

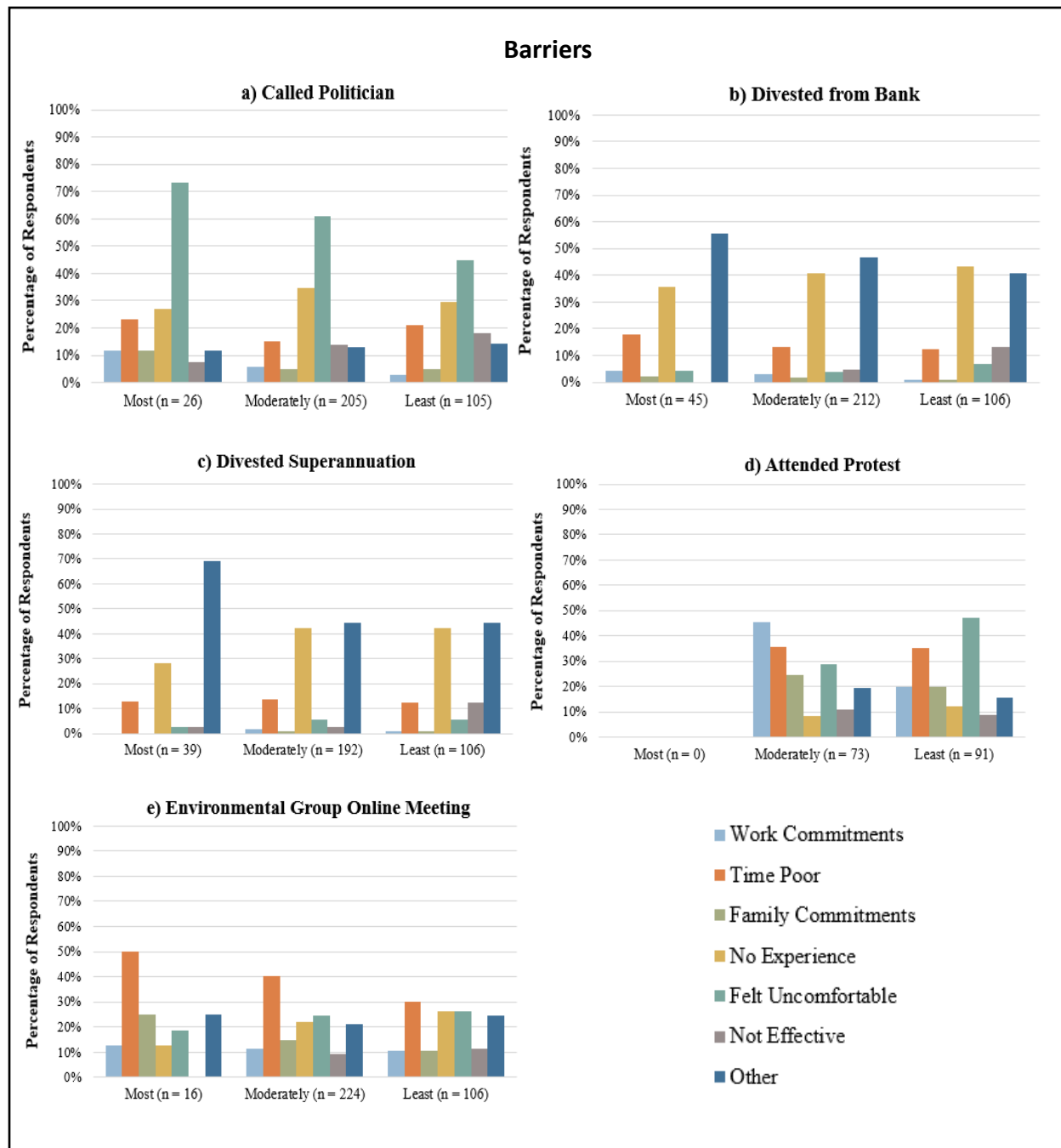


Figure 4. Distributions of barriers with unique response patterns for five behaviours: (a) called a politician; (b) divested from a bank that supports fossil fuel industries; (c) divested superannuation; (d) attended a protest; and (e) attended an environmental group online meeting.

3.4.4 Qualitative descriptions of “other” barriers. As indicated in the Method section, a full qualitative analysis was not conducted on qualitative comments from the ‘other’ text boxes. However, high rates of responses for the option of ‘other’ were evident for all Financial Activism behaviours and most SMO Engagement behaviours. It was therefore deemed necessary to include some quotes to further explore participants’ reasons for not engaging in these behaviours (refer to Table 9). Five commonly occurring responses were evident: ‘need more knowledge’, ‘had not considered or heard of this option’, ‘too difficult’, ‘occupation does not allow another option’, and ‘limited funds’.

Table 9

Qualitative Comments From ‘Other’ Text Boxes, Highlighting Reasons for not Engaging in SMO Behaviours and Financial Activism Behaviours

Behaviour	‘Other’ responses from survey participants
Donated to an environmental group	At this stage I don’t have a lot of money to donate but I also find it hard to decide on a group to donate to because I’m always unsure if they are problematic in anyway, climate related or other (e.g. racist, homophobic, sexist, etc. or if they are helping in one way but hurting in another). (Least Active respondent)
	Money is VERY tight for me right now. (Moderately Active respondent)
Attended an environmental group training session	Haven’t encountered an event and never considered it. (Least Active Respondent)
	Haven’t seen one advertised. (Most Active Respondent)
Volunteered with an environmental group	Not aware of any locally. (Moderately Active Respondent)
	Not aware of such opportunities. (Least Active Respondent)

Attended an environmental group online meeting	<p>Have not heard about this before. (Least Active Respondent)</p> <p>Didn't know about this opportunity. (Most Active Respondent)</p>
Divested an insurance policy	<p>As a sole parent, I have little spare time and have a tight budget. It feels bad not to have researched this option. I feel daunted by the time it may take to find an alternative, and worried about changing the status quo. (Most Active respondent)</p> <p>Interestingly, I had not thought about that even though I've been obsessive about getting my super out of fossil fuel investments and contacted Adani's potential insurers on multiple occasions. Weird! Anyway, looking into it now. Thanks! (Most Active respondent)</p>
Divested from a bank	<p>Haven't thought to check if my bank does this and what an alternative would be that I could afford. (Least Active respondent)</p> <p>Unfortunately, my mortgage is currently fixed. I will divest as soon as the fixed loan expires. (Most Active respondent)</p>
Divested superannuation	<p>I am with UniSuper and as a condition of my employment I cannot change superannuation fund, which frustrates me. Instead, I have written to UniSuper to expressing my dissatisfaction with their upward trend in investment in fossil fuel companies. (Moderately Active respondent)</p> <p>I did look into this a small amount but found it hard to find accessible and trustworthy information, while also considering the performance of the fund. (Least Active respondent)</p>
Boycotted a company	<p>Not enough info on which corporations should be boycotted. (Moderately Active respondent)</p> <p>I would like a list of companies to boycott. (Least Active respondent)</p>

Discussion

4.1 Overview and Summary of Findings

Regarding attitudes and behaviours towards anthropogenic climate change, past research suggests the prevalence of unique climate change attitude segments: Alarmed, Concerned, Cautious, Disengaged, Doubtful, and Dismissive (Leiserowitz et al., 2020; Maibach et al., 2011; Morrison, Duncan, Sherley, & Parton, 2013; Morrison et al., 2018). This study focused on investigating a sample of Alarmed Australian climate change activists — more specifically — identifying which climate change activism behaviours Alarmed Australians are engaging in, and the reasons for engaging, or not engaging, in these behaviours.

The first research aim was to determine which climate change activism behaviours Alarmed Australians are engaging in and whether there are unique classes of respondents engaging in each behaviour. Results from a latent class analysis suggest the presence of three classes of climate change activists: The Least, Moderately, and Most Active classes. Relative to the Least and Moderately Active classes, the Most Active class exhibits the highest probability of engagement across all behaviours in the CCAB scale except for five behaviours: meeting a politician, divesting an insurance policy, putting up a protest poster, sharing a social media post, and speaking to family and friends about the need for more climate change action (represented by ‘a’ in Figure 2).

The second research aim was to determine whether there is a difference in engagement, across classes, dependent on age, gender, inferred SES, proximity to bushfire-affected areas, and/or rural or urban place of residence. Results from a multinomial logistic regression suggest age is the only significant predictor of engagement, across classes: Relative to the Least Active class, participants in the Moderately and Most Active classes were significantly older.

The third research aim was more qualitative and descriptive in nature and explored the motivators and barriers participants cited for engaging, or not engaging, in the 18 behaviours of the CCAB scale. Results from a multiple response analysis suggest, overall, similar motivators are being cited by the Moderately and Most Active classes, while generally, similar barriers are being cited by the Least and Moderately Active classes. Furthermore, compared to the Most and Moderately Active classes, the Least Active class is citing different motivators for writing to a politician, donating to an environmental group, and speaking with friends and family about the need for action on climate change. Conversely, the Most Active class, compared to the Least and Moderately Active classes, are citing different barriers for three behaviours: calling a politician, divesting superannuation, and putting up a protest poster. Each research aim will be discussed below in further detail with comparison to past research.

4.2 Interpretation of Results and Comparisons with Past Research

4.2.1 Aim one: Latent class analysis and probability of engaging in activism

behaviours. Building upon past findings in climate change segmentation research, results from the current study suggest that even in the Alarmed segment, differing levels of activity exist (Ashworth et al., 2011; Hine et al., 2013; Leiserowitz et al., 2019; Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011; Morrison et al., 2018). These findings are similar to Doherty and Webler's (2016) research, where results suggest the presence of two Alarmed subsegments: The More and Less Active groups. Doherty and Webler's research suggest that, out of the More Active participants ($n = 437$), 75% had donated to climate organisations, 57% had volunteered with a climate organisation, and 41% had attended a climate change protest. In contrast, 42% of the Less Active group ($n = 266$) had donated to a climate organisation, 27% had volunteered with a climate organisation, and 12% had attended a climate change protest. Doherty and Webler,

however, did not conduct a latent class analysis to segment the Alarmed participants in two subsegments. They emulated Roser-Renouf et al.'s (2014) research and used one behaviour, contacting a government official, to partition the Alarmed segment in to two subsegments. If participants had contacted a government official once in the preceding 12 months, they were categorised as More Active, if not, they were classified as Less Active.

The presence of three latent classes within the Alarmed segment could be indicative of a continuum of climate change activism. Similar to Dennis' (2019) research on a continuum of political participation, individuals could start engaging in the quick and relatively easy activism behaviours — such as the three Social/Online Activism behaviours measured in the current study — then progress on to more demanding activism behaviours like protesting, divesting, or engaging political representatives. Dennis (2019) suggests quick, online examples of activism, or slacktivism, is behaviour that can occur across the continuum of participation. Consistent with the Access, Expression, Connection, and Action stages in Dennis' (2019) continuum of political participation, engagement in Social/Online Activism behaviours could expose individuals to the information and modelled behaviour of other, more active, climate change activists. After exposure to these more time-intensive behaviours, individuals might then feel more comfortable engaging in these more demanding behaviours. This point will be discussed further in the section below on Future Research.

4.2.2 Aim two: Predictors of class membership. Results from the current study suggest age is predictive of class membership. Relative to the Least Active class, the Most and Moderately Active classes were significantly older. These results contrast with Roser-Renouf et al.'s (2014) findings, where gender was significantly associated with climate change activism. Considering the choice to include a first-year Psychology student sample in the main data

analysis stage, results from the current study may be a consequence of sampling. Alternatively, as Dennis' (2019) continuum of participation suggests, these results could reflect the possibility of climate change activism existing on a continuum. Younger members of the population may engage in less types of climate change activism because they may not be engaging in some of the Financial Activism or Political Participation behaviours yet. Furthermore, unless they have grown up in households that model political participatory behaviours, such as writing, calling, and meeting politicians, younger participants may not know how to go about engaging in these types of behaviours.

4.2.3 Aim three: Motivators for and barriers to activism behaviours. Consistent with past research regarding self-, collective-, and political-efficacy (Doherty & Webler, 2016; Van Zomeren, Postmes, & Spears, 2008), results from the current study suggest many of the Alarmed participants engaged in climate change activism behaviours because they believed the behaviour to be an 'important' and 'effective' activity. Across classes, these motivators were generally the two most-cited reasons for engagement, except for two of the Social/Online Activism behaviours — signed an online petition and shared a social media post — where 'quick' was the most-cited motivator.

Conversely, UK research into the barriers of climate change action suggest factors such as 'lack of experience', 'uncertainty of the effectiveness of actions', and 'more immediate priorities' (i.e., family commitments and financial strains), contribute to individuals not engaging in individual-level approaches to climate change action (Ockwell et al., 2009). These findings are also similar to findings from the current study, where, for many behaviours in the CCAB scale, 'no experience', 'time-poor', 'work commitments', and 'family commitments' were cited as barriers to engagement.

Roser-Renouf et al. (2014) used ‘perceived barriers to climate activism’ as an indirect measure of self-efficacy. Their research assessed both actual behaviour and future intentions to engage in three climate change activism behaviours: contacting politicians; attending climate change protests; and volunteering or donating to a climate action organisation. A total of 25 barriers were used to assess the three activism behaviours, and included ‘perceived response efficacy’, ‘identity’, ‘interest’, and ‘low skills’ (Roser-Renouf et al., 2014). Consistent with social movement research (Stekelenburg & Klandermans, 2017), results suggest ‘lack of activist identity’ was the largest barrier to individuals engaging in climate change activism; one third of participants said they were not climate change activists (Roser-Renouf et al., 2014). Roser-Renouf (2014) also found ‘effectiveness’ to be a major barrier to climate change activism. In particular, 22% of participants thought donating to climate change organisations were highly or pretty effective, 15% believed contacting political representatives to be effective, while only 12% thought attending protests were effective. Overall, nearly 74% thought none of the three activism behaviours were effective. Results regarding effectiveness from Roser-Renouf et al.’s (2014) research, differ to results from the current study. Generally, ‘effective’ and ‘important’ were the two most-cited motivators for engagement across most of the 18 behaviours in the CCAB scale.

4.3 Implications and Recommendations

Results from the current study suggest Alarmed Australians cite a variety of motivators for and barriers to climate change activism behaviours. Research from the current study could provide SMOs with information needed to increase public engagement with the issue of anthropogenic climate change. Increased public engagement could, in turn, lead to the political and societal changes we are requiring from our global governments (Ockwell et al., 2009).

Ockwell et al. (2009) highlight the stalemate situation global climate change action faces. On one hand, governments are needing to implement policies and legislation to reduce carbon emissions from major carbon-emitting sectors. While on the other hand, past examples of governments forcing more sustainable behaviour on populations, have backfired (Ockwell et al., 2009). The UK fuel protests in 2000 are a good example of how government environmental taxes on petrol and diesel led to public protests that brought the UK to a standstill (Ockwell et al., 2009). In response, the government reneged and suspended the taxes on petrol and diesel. Ockwell et al. (2009) advocate for a top-down and bottom-up approach to action on climate change. They insist effective action on climate change can only occur with a combination of governmental action (top-down strategies) and pressure from the population (bottom-up strategies). The following sections highlight how populations may increase action in the five areas of climate change activism measured in the current study: Political Participation, Financial Activism, Non-violent Protests, Engagement with a SMO, and Social/Online Activism. In relation to the current study's findings, recommendations will be elaborated upon in each area.

4.3.1 Political participation. Results from the current study suggest the Most Active class has a higher probability of meeting, calling, and writing to politicians, compared to the Moderately and Least Active class. When barriers were explored as to why this might be occurring, results suggest the Moderately and Least Active classes cite similar barriers for these behaviours, with 'no experience', 'felt uncomfortable' and 'time-poor', being notable barriers. In line with findings from the Six Americas research (Leiserowitz et al., 2019), and Roser-Renouf et al.'s (2014) research, well-known and trustworthy public figures, known as opinion leaders, could advocate for and model political participatory behaviours. This type of modelled behaviour could connect with strategies SMOs are already promoting on their websites (i.e., advice on how

to lobby Members of Parliament (MP) or Senators). Many SMOs already have advice on their websites about how to engage politicians, however, by increasing the salience of these important political participatory behaviours (i.e., by having public figures advocating for political participation) more of the Australian public could pressure elected representatives to enact more effective climate change mitigation policies.

4.3.2 Financial activism. As mentioned in the Results, generally, the three most-cited barriers across all four Financial Activism behaviours were ‘time-poor’, ‘no-experience’ and ‘other’. Qualitative quotes from the open-ended text boxes revealed a number of recurring responses for ‘other’, including ‘need more knowledge’, ‘had not considered or heard of divesting or boycotting options’, ‘too difficult’, and ‘occupation does not allow another option’. A recommendation aimed at increasing public awareness of the divestment movement would be to share information from Australian divestment SMOs such as Market Forces (Market Forces, 2020). Market Forces provides informative spreadsheets to members of the Australian public who are keen to divest their money from banks, superannuation funds, and insurance companies that finance the fossil fuel industry. Instead, Market Forces advocates for the support of financial institutions that finance renewable energies. Environmental advocacy groups could collaborate with Market Forces, with the aim of disseminating divestment information via their emailing lists.

4.3.3 Social/online activism. The three Social/Online Activism behaviours exhibited high probabilities of engagement across classes. When motivators of the two online behaviours — signing a petition and sharing a social media post — were explored, ‘quick’ was a notable motivator across classes. In contrast, ‘important’ was the most-cited motivator for speaking with friends and family about the need for more effective climate change action. Results from Roser-

Renouf et al. (2014) suggest opinion leadership — known as interpersonal discussion and influence — is a strong predictor of climate change activism. Additionally, in their research on social network analyses, Fowler and Christakis (2010) suggest the effects of interpersonal influence can reach as many as 1000 people and three degrees of separation. Increasing opinion leadership may therefore be an effective way to disseminate key messages via online and face-to-face social networks. Findings from Leiserowitz et al. (2009) support this notion: Results from their study suggest individuals are more persuaded by people they know, compared to people they do not know (i.e., with the exception of climate scientists).

4.3.4 Non-violent protests. Results from the Non-violent Protest behaviour category suggest the two most likely engaged behaviours across classes, were attending a protest and encouraging friends or family to attend a protest. This finding reflects the increasing prevalence of climate change protest engagement across the globe (McKnight, 2020; Boulianne, Lalancette, & Ilkiw, 2020; Rootes, 2012). However, probability of engagement from the Least Active class still seems to be low, in comparison to the Moderately and Most active classes. Promoting protest efficacy among the Least Active class could possibly increase engagement from this class. An example, in 1986, the People Power protests in the Philippines included approximately two million citizens collectively acting to bring about the fall of the Marcos dictatorship (Schock, 1999). Furthermore, promoting Stephan and Chenoweth's (2008) '3.5% Rule' could also lead to an increase in protest engagement from the Least Active class: As mentioned in the Introduction, if 3.5% of a population, or 875,000 Australians, engaged in nonviolent resistance, Stephan and Chenoweth's (2008) analyses suggest systemic change followed 53% of the time.

4.3.5 Engagement with a SMO. For each SMO behaviour, significant pairwise differences in the probably of engagement were observed across all three classes. However, the

probability of engagement was notably higher in the Most Active class, compared to the Moderately and Least Active classes. When barriers were explored, ‘time-poor’, ‘no experience’, and ‘other’ were the three most-cited barriers. Quotes from the open-ended ‘other’ response option revealed limited funds to be a barrier for donating to an environmental group, while it seems many respondents were not aware of SMO group training sessions, online meetings, or volunteering options. Increasing the visibility of these options within our population could be one possible avenue for increasing engagement in these three behaviours.

4.4 Limitations and Future Research

A limitation of the current study is the use of American norms in the Six Americas segmentation scale. KnowledgePanel was used to recruit participants across the US, using random digit dialling methodology to ensure a representative American sample. Even though the Six Americas surveys have been utilised in past Australian climate change segmentation research (Ashworth et al., 2011; Morrison et al., 2018), an possible avenue for future research would be the development of a Six Australians segmentation scale, based on Australian norms.

Self-selection bias is a second limitation of the current study. Participants hypothesised to be from a population of climate change activists, self-selected and completed the survey in Qualtrics. Therefore, results may reflect participants who had the time and motivation to complete an online survey, rather than truly reflecting Alarmed Australians’ engagement in climate change activism. To ensure a more representative sample, future research could focus on employing a random sampling process, within a population of Alarmed Australians.

A third limitation of the current study is the cross-sectional nature of the research. The cross-sectional nature of this study makes it difficult to ascertain whether the Least, Moderately, and Most Active classes are static or fluid. Longitudinal research paired with an intervention,

could be a possible avenue for future research to determine if interventions could increase membership in the Least and Moderately Active classes. This may result in an overall increase in activity from the Alarmed segment. In line with current research from the Six Americas project, a potential intervention could be to focus on the role of the messenger (Leiserowitz et al., 2019). For instance, recent Six Americas research suggests many Americans indicated they would join a climate action campaign if well-known and respected public figures, such as Leonardo DiCaprio, Pope Francis, and Congresswoman Alexandria Ocasio-Cortez, asked them to join (Leiserowitz et al., 2019). Finally, longitudinal research could attempt to determine if climate change activism is static, or on a continuum of participation, similar to Dennis' (2019) four-stage participation continuum.

As mentioned in the Method and Results, a full qualitative analysis was not conducted on participants' reasons for engaging or not engaging in behaviours in the CCAB scale. Therefore, another potential avenue for future research would be to conduct a full thematic analysis on comments provided by participants for the 'other' option in the CCAB scale. The insights provided by this qualitative analysis could help to further understand behaviours with high occurrences of 'other'.

4.5 Conclusion

In summary, results from this study suggest the presence of three latent classes in the CCAB scale: The Least, Moderately, and Active classes. Furthermore, results suggest age was the only significant predictor of class membership, with the Moderately and Most Active participants being significantly older than the Least Active participants. Finally, findings suggest the Moderately and Most Active participants cited similar motivators for engaging in climate

change activism behaviours, while the Least and Moderately Active classes cited similar barriers to these activism behaviours.

In conclusion, the IPCC has been advising global governments for decades of the need to reduce global carbon emissions (Masson-Delmotte et al., 2018). Excluding carbon emission reductions due to the Covid-19 pandemic (Le Quéré et al., 2020), global governments have not acted robustly enough to reduce the carbon emitted from their countries (Masson-Delmotte et al., 2018). According to Stephan and Chenoweth (2008) and Ockwell et al.'s (2009) research, populations could engage more in collective action to increase pressure on governments and bring about government-led climate change mitigation policies. History demonstrates the power of collective action: Tipping points occur if enough people act collectively, as the women's and civil rights movements attest to. Will this period of human history be known as the climate rights movement? Will enough of the population collectively engage to bring about the required systemic changes from global governments? Time will tell.

References

- Fossil Free Divestment. (2020). *1000+ divestment commitments*. Fossil Free Divestment. Retrieved September 1, 2020, from <https://gofossilfree.org/divestment/commitments/>
- Ashworth, P., Jeanneret, T., Gardner, J., & Shaw, H. (2011). *Communication and climate change: What the Australian public thinks*. CSIRO Canberra.
- Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using MPlus. *Structural Equation Modeling: A Multidisciplinary Journal*, 21(3), 329-341.
- Australian Bureau of Statistics (ABS). (2017, October). *1270.0.55.004 - Australian Statistical Geography Standard (ASGS): volume 4 – significant urban areas, urban centres and localities, section of state*. ABS. <https://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.004>
- Australian Bureau of Statistics (ABS). (2020). *SEIFA by Postal Area Code (POA)*. ABS. Retrieved August 20, 2020, from http://stat.data.abs.gov.au/Index.aspx?DataSetCode=SEIFA_POA
- Australian Taxation Office (ATO). (2020, April). *Postcodes identified for deferral*. Australian Government. <https://www.ato.gov.au/General/Dealing-with-disasters/In-detail/Specific-disasters/Bushfires-2019-20/?anchor=Postcodesidentifiedfordeferral#Postcodesidentifiedfordeferral>
- Ayling, J., & Gunningham, N. (2017). Non-state governance and climate policy: The fossil fuel divestment movement. *Climate Policy*, 17(2), 131-149.

- Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D., Marlow, C., Settle, J. E., & Fowler, J. H. (2012). A 61-million-person experiment in social influence and political mobilization. *Nature*, 489(7415), 295-298.
- Boulianne, S., Lalancette, M., & Ilkiw, D. (2020). "School Strike 4 Climate": Social media and the international youth protest on climate change. *Media and Communication*, 8(2), 208-218.
- Bryant, R. A., Gibbs, L., Gallagher, H. C., Pattison, P., Lusher, D., MacDougall, C., ... & Richardson, J. (2018). Longitudinal study of changing psychological outcomes following the Victorian Black Saturday bushfires. *Australian and New Zealand Journal of Psychiatry*, 52(6), 542-551.
- Corning, A. F., & Myers, D. J. (2002). Individual orientation toward engagement in social action. *Political Psychology*, 23(4), 703-729.
- DEFRA, A. (2008). Framework for pro-environmental behaviours. Department for environment, food and rural affairs. *British Government, London*, 76.
- Delacote, P. (2009). On the sources of consumer boycotts ineffectiveness. *The Journal of Environment and Development*, 18(3), 306-322.
- Doherty, K. L., & Webler, T. N. (2016). Social norms and efficacy beliefs drive the alarmed segment's public-sphere climate actions. *Nature Climate Change*, 6(9), 879-884.
- Esposito, B. (2019, September 20). *Global climate strike sees 'hundreds of thousands' of Australians rally across the country*. ABC News. <https://www.abc.net.au/news/2019-09-20/school-strike-for-climate-draws-thousands-to-australian-rallies/11531612>

- Flynn, B. S., Worden, J. K., Bunn, J. Y., Dorwaldt, A. L., Connolly, S. W., & Ashikaga, T. (2007). Youth audience segmentation strategies for smoking-prevention mass media campaigns based on message appeal. *Health Education and Behavior, 34*(4), 578-593.
- Fowler, J. H., & Christakis, N. A. (2010). Cooperative behavior cascades in human social networks. *Proceedings of the National Academy of Sciences, 107*(12), 5334-5338.
- Hine, D. W., Reser, J. P., Phillips, W. J., Cooksey, R., Marks, A. D., Nunn, P., . . . Glendon, A. I. (2013). Identifying climate change interpretive communities in a large Australian sample. *Journal of Environmental Psychology, 36*, 229-239.
- Van Stekelenburg, J., & Klandermans, B. (2017). Individuals in movements: A social psychology of contention. In *Handbook of social movements across disciplines* (pp. 103-139). Springer, Cham.
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Gustafson, A., Ballew, M., . . . Gustafson, A. (2020). *Climate change in the American mind: November 2019*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Ballew, M., Goldberg, M., & Gustafson, A. (2020). *Climate Change in the American Mind: November 2019*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2009). *Climate change in the American mind*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

- Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J., Abernethy, S., Andrew, R. M., ... & Friedlingstein, P. (2020). Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement. *Nature Climate Change*, 1-7.
- Mackie, D. M., Devos, T., & Smith, E. R. (2000). Intergroup emotions: Explaining offensive action tendencies in an intergroup context. *Journal of Personality and Social Psychology*, 79(4), 602.
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. *PloS One*, 6(3), e17571.
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., Mertz, C., & Akerlof, K. (2011). Global warming's Six Americas screening tools: Survey instruments; instructions for coding and data treatment; and statistical program scripts. *Yale Project on Climate Change Communication, New Haven, CT*.
- Market Forces. (2020). *No time to waste*. Market Forces. Retrieved September 25, 2020, from <https://www.marketforces.org.au/>
- Masson-Delmotte, V., Zhai, P., Pörtner, H.-O., Roberts, D., Skea, J., Shukla, P., . . . Pidcock, R. (2018). *Global Warming of 1.5 OC: An IPCC Special Report on the Impacts of Global Warming of 1.5° C Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*: World Meteorological Organization Geneva, Switzerland.
- McKnight, H. (2020). 'The oceans are rising and so are we': Exploring utopian discourses in the school strike for climate movement. *Brief Encounters*, 4(1).

- Morozov, E. (2011). *The net delusion: How not to liberate the world*: Penguin UK.
- Morrison, M., Duncan, R., Sherley, C., & Parton, K. (2013). A comparison between attitudes to climate change in Australia and the United States. *Australasian Journal of Environmental Management*, 20(2), 87-100.
- Morrison, M., Parton, K., & Hine, D. W. (2018). Increasing belief but issue fatigue: Changes in Australian household climate change segments between 2011 and 2016. *PloS one*, 13(6), e0197988.
- Newnham, E. A., Titov, N., & McEvoy, P. (2020). Preparing mental health systems for climate crisis. *The Lancet Planetary Health*, 4(3), e89-e90.
- O'brien, K., Selboe, E., & Hayward, B. M. (2018). Exploring youth activism on climate change. *Ecology and Society*, 23(3).
- Obar, J. A., Zube, P., & Lampe, C. (2012). Advocacy 2.0: An analysis of how advocacy groups in the United States perceive and use social media as tools for facilitating civic engagement and collective action. *Journal of Information Policy*, 2, 1-25.
- O'Cathain, A., Murphy, E., & Nicholl, J. (2010). Three techniques for integrating data in mixed methods studies. *British Medical Journal*, 341.
- Ockwell, D., Whitmarsh, L., & O'Neill, S. (2009). Reorienting climate change communication for effective mitigation: Forcing people to be green or fostering grass-roots engagement? *Science Communication*, 30(3), 305-327.
- Pachauri, R. K., Allen, M. R., Barros, V. R., Broome, J., Cramer, W., Christ, R., . . . Dasgupta, P. (2014). *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change*: Ippc.

- Palmgreen, P., & Donohew, L. (2006). Effective mass media strategies for drug abuse prevention campaigns. In *Handbook of drug abuse prevention* (pp. 27-43): Springer.
- Pezzullo, P. C. (2011). Contextualizing boycotts and buycotts: The impure politics of consumer-based advocacy in an age of global ecological crises. *Communication and Critical/Cultural Studies*, 8(2), 124-145.
- Rootes, C. (2012). Climate change, environmental activism and community action in Britain. *Social Alternatives*, 31(1), 24.
- Schock, K. (1999). People power and political opportunities: Social movement mobilization and outcomes in the Philippines and Burma. *Social Problems*, 46(3), 355-375.
- Simon, B., & Klandermans, B. (2001). Politicized collective identity: A social psychological analysis. *American Psychologist*, 56(4), 319.
- Simon, B., Loewy, M., Stürmer, S., Weber, U., Freytag, P., Habig, C., . . . Spahlinger, P. (1998). Collective identification and social movement participation. *Journal of Personality and Social Psychology*, 74(3), 646.
- Slater, M. D. (1996). Theory and method in health audience segmentation. *Journal of Health Communication*, 1(3), 267-284.
- Smith, E. R. (1993). Social identity and social emotions: Toward new conceptualizations of prejudice. In *Affect, cognition and stereotyping* (pp. 297-315): Elsevier.
- SONA Systems. (2020). *Research management*. SONA Systems. Retrieved September 2, 2020, from <https://www.sona-systems.com/research-management.aspx>
- Stephan, M. J., & Chenoweth, E. (2008). Why civil resistance works: The strategic logic of nonviolent conflict. *International Security*, 33(1), 7-44.

Stúrmer, S., & Simon, B. (2004). Collective action: Towards a dual-pathway model. *European Review of Social Psychology, 15*(1), 59-99.

Theocharis, Y. (2012). Cuts, tweets, solidarity and mobilisation: How the internet shaped the student occupations. *Parliamentary Affairs, 65*(1), 162-194.

Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin, 134*(4), 504.

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political Analysis, 450-469*.

Appendix A

The Six Americas Segmentation Scale

(The 15-item instrument correctly classifies 84% of the sample, ranging by segment from 60% to 97%).

Recently you may have noticed that global warming has been getting some attention in the news. Global warming refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result.

1. What do you think? Do you think that climate change is happening?

Yes...

...and I'm extremely sure

...and I'm very sure

...and I'm somewhat sure

...but I'm not at all sure

No...

...and I'm extremely sure

...and I'm very sure

...and I'm somewhat sure

...but I'm not at all sure

Or...

I don't know

2. Assuming climate change is happening, do you think it is ...

Caused mostly by human activities

Caused mostly by natural changes in the environment

Other

None of the above because global warming isn't happening

3. How worried are you about climate change?

Very worried

Somewhat worried

Not very worried

Not at all worried

4. How much do you think climate change will harm you personally?

Not at all

Only a little

A moderate amount

A great deal

Don't know

5. When do you think climate change will start to harm people in Australia?

They are being harmed now

In 10 years

In 25 years

In 50 years

In 100 years

Never

6. How much do you think climate change will harm future generations of people?

Not at all

Only a little

A moderate amount

A great deal

Don't know

7. How much had you thought about climate change before today?

A lot

Some

A little

Not at all

8. How important is the issue of climate change to you personally?

Not at all important

Not too important

Somewhat important

Very important

Extremely important

9. How much do you agree or disagree with the following statement: "I could easily change my mind about climate change."

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

10. How many of your friends share your views on climate change?

- None
- A few
- Some
- Most
- All

11. Which of the following statements comes closest to your view?

Climate change isn't happening.

Humans can't reduce climate change, even if it is happening.

Humans could reduce climate change, but people aren't willing to change their behavior so we're not going to.

Humans could reduce climate change, but it's unclear at this point whether we will do what's needed.

Humans can reduce climate change, and we are going to do so successfully.

12. Do you think citizens themselves should be doing more or less to address climate change?

- Much less
- Less
- Currently doing the right amount
- More
- Much more

13. Over the past 12 months, how many times have you punished companies that are opposing steps to reduce climate change by NOT buying their products?

- Never
- Once

A few times (2-3)

Several times (4-5)

Many times (6+)

Don't know

14. Do you think climate change should be a low, medium, high, or very high priority for the Australian Federal Government?

Low

Medium

High

Very high

15. People disagree whether Australia should reduce greenhouse gas emissions on its own, or make reductions only if other countries do too. Which of the following statements comes closest to your own point of view?

Australia should reduce its greenhouse gas emissions ...

Regardless of what other countries do

Only if other industrialized countries (such as England, Germany, the USA, and Japan) reduce their emissions

Only if other industrialized countries and developing countries (such as China, India and Brazil) reduce their emissions

Australia should not reduce its emissions

Don't know

Appendix B

Table B.2

Predictive Validity: Results of Chi-square Tests of Independence Between the 12 Dismissive Participants and two Samples of 12 Randomly Selected Alarmed Participants

Activist behaviour in CCAB scale	Alarmed sample 1		Alarmed sample 2	
	Test statistic	<i>p</i>	Test statistic	<i>p</i>
Political participation				
Met politician	4.80 ^a	.09	4.80 ^a	.09
Called politician	4.80 ^a	.09	4.80 ^a	.09
Wrote to politician	12.00 ^a	.001***	12.00 ^a	.001***
Financial activism				
Divested an insurance policy	2.182 ^a	.48	2.18 ^a	.48
Divested from bank	6.316 ^a	.04*	6.32 ^a	.04*
Divested superannuation	6.316 ^a	.04*	6.32 ^a	.04*
Boycotted company	20.31	.001***	20.31	.001***
Non-violent protests				
Helped organise protest	2.182 ^a	.48	2.18 ^a	.48
Put up protest poster	6.316 ^a	.04*	6.32 ^a	.04*
Encouraged family/friends to attend protest	20.31	.001***	20.31	.001***
Attended protest	20.31	.001***	20.31	.001***
SMO engagement				
Environmental group training	4.80 ^a	.09	4.80 ^a	.09
Environmental group online meeting	4.80 ^a	.09	4.80 ^a	.09
Environmental group volunteer	8.00 ^a	.01**	8.00 ^a	.01**
Donated to environmental group	17.14	.001***	17.14	.001***
Social/online activism				
Shared social media post	20.31	.001***	20.31	.001***
Spoke with friends/family	20.31	.001***	20.31	.001***
Signed online petition	20.31	.001***	20.31	.001***

Note. Tests of independence were conducted twice (i.e., between the 12 Dismissive and 12 randomly selected Alarmed participants, and a second time with 12 newly randomly selected Alarmed participants). SMO = Social Movement Organisation.

^a Indicates Fisher's exact tests were used. For all other chi-square tests $\chi^2(df = 1, N = 12)$.

p* < .05. ** *p* < .01. * *p* ≤ .001.

Appendix C

Table C.3

Table of Odds Ratios Indicating Whether Participants in Each Pair of Latent Classes Differed Significantly in Terms of Probability of Engagement in Each Activist Behaviour

Activist behaviour	Class 3 vs 2	Class 3 vs 1	Class 2 vs 1	Significant difference between/ across classes
	Most vs Moderately Active Odds ratio CI	Most vs Least Active Odds ratio CI	Moderately vs Least Active Odds ratio CI	
Political participation				
Met politician	19.255 [8.437, 43.943]	77.474 [10.072, 595.906]	4.024 [0.455, 35.563]	b
Called politician	7.718 [4.411, 13.504]	79.655 [8.123, 781.058]	10.321 [1.042, 102.278]	a
Wrote to politician	11.547 [3.740, 35.655]	60.624 [18.057, 203.544]	5.25 [2.674, 10.306]	a
Financial activism				
Divested insurance policy	2.701 [1.523, 4.789]	76.3 [0.004, >1000]	28.251 [0.001, >1000]	d
Divested from bank	4.071 [2.407, 6.885]	61.679 [13.799, 275.699]	15.15 [3.373, 68.045]	a
Divested superannuation	3.863 [2.174, 6.862]	72.844 [13.557, 391.406]	18.857 [3.718, 95.643]	a
Boycotted company	4.147 [1.803, 9.542]	24.474 [9.408, 63.665]	5.901 [3.029, 11.495]	a
Non-violent protests				

	148.508	>1000	>1000	
Helped organise protest	[27.599, 799.109]	[>1000, >1000]	[>1000, >1000]	a
	22.46	96.896	4.314	
Put up protest poster	[11.603, 43.477]	[22.604, 415.360]	[0.944, 19.720]	b
	23.612	899.639	38.101	
Encouraged family or friends to attend protest	[3.210, 173.678]	[82.275, >1000]	[8.658, 167.672]	a
	>1000	>1000	13.791	
Attended protest	[>1000, >1000]	[>1000, >1000]	[6.281, 30.277]	a
SMO engagement				
	24.3	117.154	4.821	
Environmental group training	[12.375, 47.717]	[30.221, 454.161]	[1.286, 18.072]	a
	20.475	255.213	12.464	
Environmental group online meeting	[10.549, 39.744]	[48.740, >1000]	[2.489, 62.422]	a
	23.22	182.822	7.874	
Environmental group volunteer	[10.657, 50.593]	[36.322, 920.220]	[1.611, 38.480]	a
	7.778	57.192	7.353	
Donated to environmental group	[3.045, 19.870]	[18.051, 181.205]	[3.517, 15.372]	a
Social/online activism				
	3.496	29.759	8.512	
Shared social media post	[0.742, 16.474]	[6.188, 143.104]	[3.744, 19.352]	c
	10.119	43.317	4.281	
Spoke with friends or family	[0.311, 329.744]	[1.509, >1000]	[1.851, 9.901]	c
	> 1000	> 1000	34.905	
Signed online petition	[>1000, >1000]	[>1000, >1000]	[7.414, 164.336]	a

Note. *If CI does not include 1, the difference is significant at $p < .05$ (shaded cells). *a* denotes a significant pairwise difference in behaviour engagement probability across all three classes; *b* denotes significant pairwise differences across all but the Moderately and Least Active classes; *c* denotes significant pairwise differences across all but the Moderately and Most Active classes; and *d* denotes a significant pairwise difference across the Most and Moderately Active classes only.

Appendix D

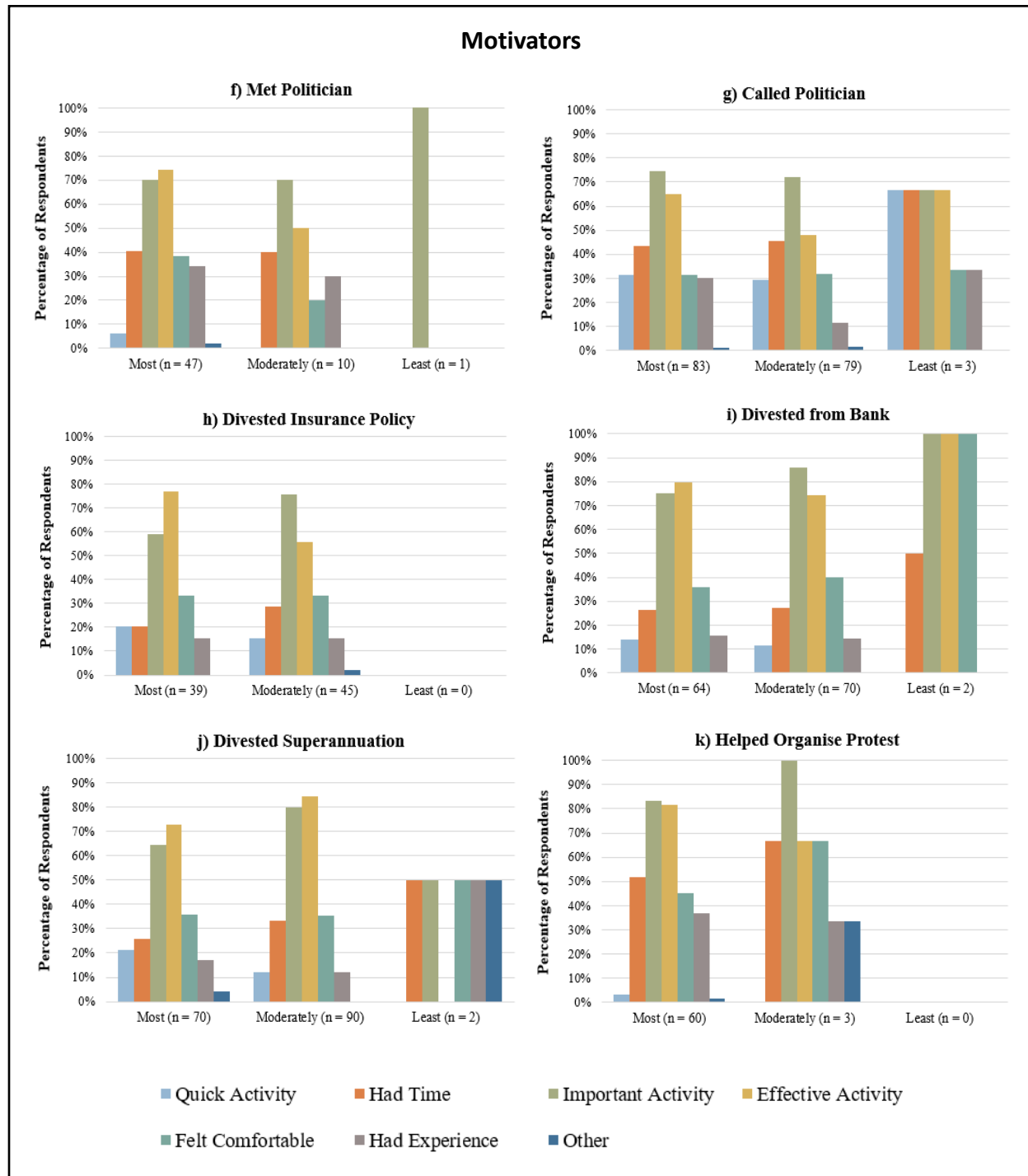


Figure D.4 Distributions of motivators with response patterns for six activism behaviours (f – k) across classes.

Appendix E

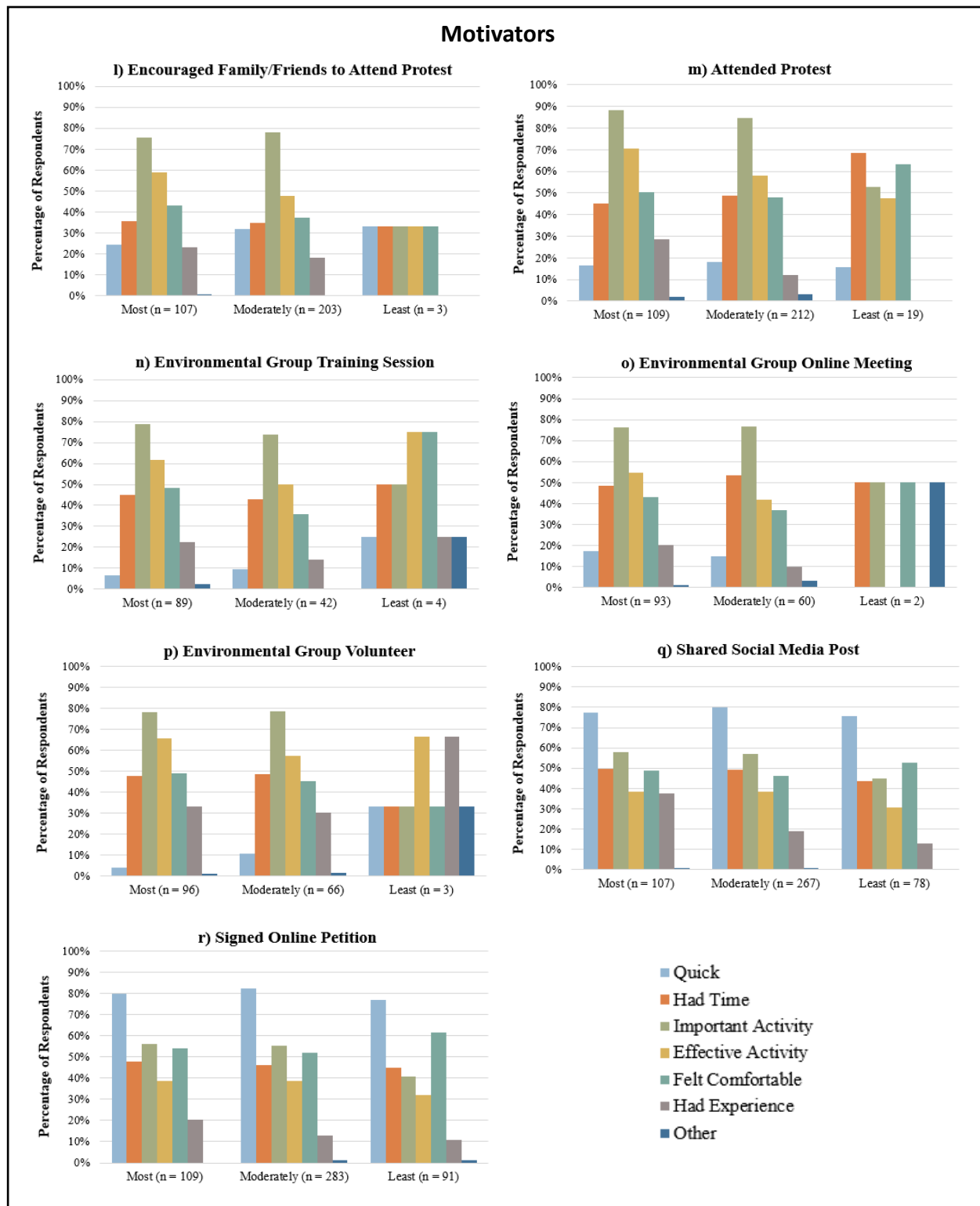


Figure E.5 Distributions of motivators with response patterns for six activism behaviours (1 - r) across classes

Appendix F

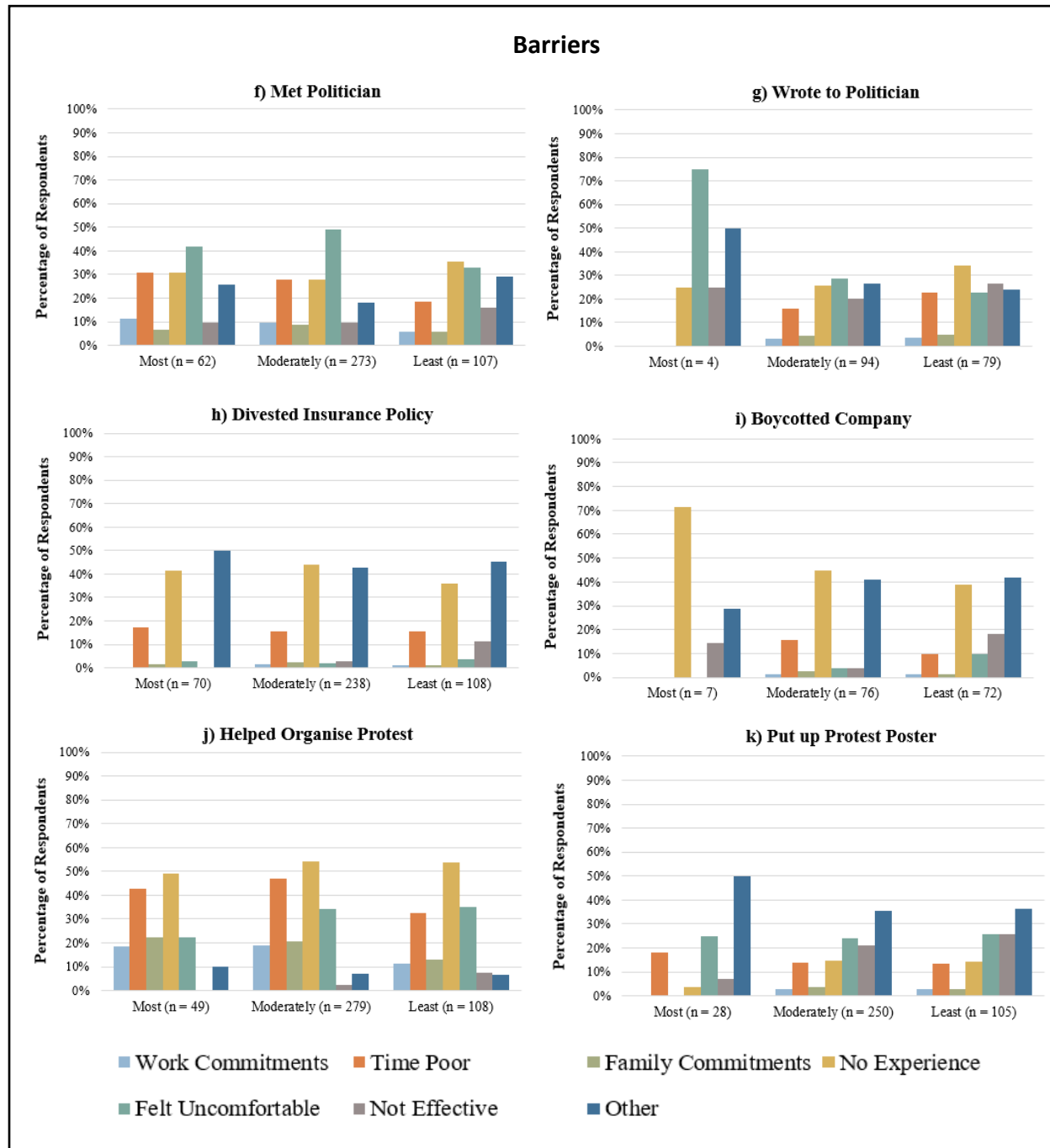


Figure F.6 Distributions of barriers with response patterns for six activism behaviours (f - k) across classes

Appendix G

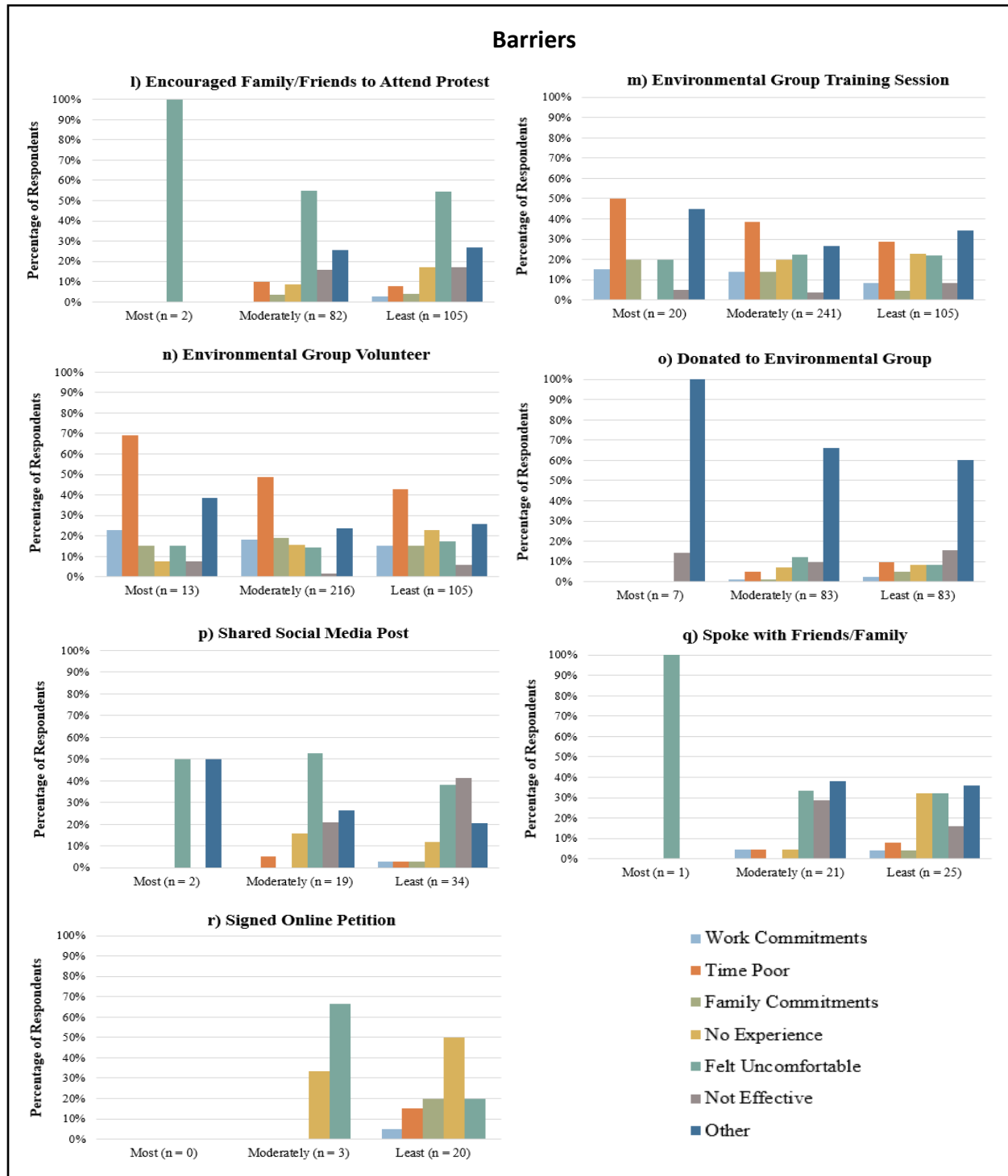


Figure G.7 Distributions of barriers with response patterns for six activism behaviours (l - r) across classes