

**Adaptation, Arsonists, and Apocalypses: Exploring Social Representations of
Anthropogenic Climate Change on Australian Social Media Before and During the
“Black Summer Bushfires”**



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Abstract

Australia's 2019-2020 "Black Summer Bushfires" were an unprecedented extreme weather event, which evidence suggests was made substantially worse by the effects of anthropogenic climate change. This event, and previous weather events, have been demonstrated to affect how people view climate change, with general research findings indicating that extreme weather events increase people's agreement and acceptance of the existence of climate change. However, there is still little research into how these extreme weather events affect the views of people who do not believe in the existence of climate change. This study aims to rectify this gap in the research. By using qualitative reflexive Thematic Analysis, 999 unique tweets were assessed within a Social Representations Theory framework to explore how individual's representations of climate change were affected due to the Black Summer Bushfires. The results of this thematic analysis indicated denialist representations fractured during January as they were unable to reconcile their representations of climate change not being real with evidence the bushfires were caused and exacerbated by climate change. Additionally, consensus, science-based representations were made more cohesive from the fires and made explicit use of the bushfires as physical evidence of climate change to both advance the consensus representation and depoliticise the argument surrounding climate change. These results suggest that more atypical extreme weather events, like the Black Summer Fires, have an increased impact on social representations of climate change, resulting in substantial changes for both consensus-based views and denialist-based views.

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.

Contribution Statement

The majority of the work conducted for this thesis was by myself, including the complete write up of all sections and the thematic analysis. However, the data used for this study is secondary data which was collected and organised by a previous Honours student who was also supervised by my current supervisor. I have used their collated data already premade into an 'Nvivo12' file that had been stripped of any other data apart from the original collected tweets. A university professor also contributed by helping amend difficulties which occurred during the operation of the 'R' statistical program that collected and ordered the tweets. Last, and certainly not least, was the contribution by my Honours supervisor, who provided me with the secondary data and helped formulate the original idea of this thesis along with helping formulate the initial deductive coding framework and ensuring I was on track with inductive coding and theme formulation practices.

**Adaptation, Arsonists, and Apocalypses: Exploring Social Representations of
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Anthropogenic Climate Change (ACC), the rapidly accelerated warming of Earth primarily due to human activities, is increasingly viewed as one of the most critical threats facing countries worldwide (Rudman et al., 2013). The Intergovernmental Panel on Climate Change have warned that unless global temperatures are kept within 1.5°C of warming the consequences will be devastating (Atzori et al., 2019).

The impact of ACC can already be seen through the increasing severity and frequency of Extreme Weather Events (EWE) (Roxburgh et al., 2019). EWE is a term describing a variety of weather events that can be influenced by ACC (Howe, 2021). This includes short-term events like floods, cyclones, and bushfires to long-term events such as drought. The important distinction being the events can be scientifically attributed to ACC (Howe, 2021). Countries are becoming increasingly vulnerable to these EWEs as regional climates and weather patterns are altered by ACC.

This vulnerability to EWEs was demonstrated in Australia with the advent of the “Black Summer Bushfires” (a.k.a. ‘the bushfires’). These were unprecedented in scale, with every Australian state and territory experiencing bushfires throughout the summer (Davey & Sarre, 2020). Officially starting in September 2019, the bushfires burned an estimated 30-39 million hectares of land “including a historically unprecedented 5.67 million hectares of Eucalyptus forest” (Dickman, 2021, p. 1162; Jalaludin & Morgan, 2021). An estimated one to three billion animals died during the bushfires (Jalaludin & Morgan, 2021). Thirty-three people also died, with an additional 417 deaths nationwide from respiratory problems caused by the immense smoke cloud covering the nation (Dickman, 2021). The last bushfires were not extinguished until March 2020 (Davey & Sarre, 2020). ACC was listed as one of the

leading causes of the fires because of its role in making 2019 the hottest year in Australia in recorded history, and due to the particularly severe drought large bushfire affected areas had experienced throughout 2018-2019 (Oldenborgh et al., 2021).

Despite the tangible effects ACC had on creating and sustaining the fires, denial of the link between the fires and ACC was pronounced (Jolly, 2020). ACC denial is a multi-faceted term, which encompasses views of ACC that do not fall under the ‘consensus’, i.e. science-based representation of ACC being a real and human caused phenomenon (Whitmarsh, 2011). The denialist views contains ideas from the outright denial of climate change to the belief that it exists but humans have no effect on it. The core of denialism is the rejection of evidence that global climate is affected by human activity (Whitmarsh, 2011).

Social Representations Theory

Denialist representations of ACC cause difficulty in efforts to mitigate and combat ACC (Caillaud, 2016). This is compounded by the increasing threat of EWEs, and the conflicting evidence over the effect such events have on representations of ACC (Olausson, 2011). There is a need to understand how consensus and denialist representations of ACC are constructed and how they are affected by EWEs. This can be achieved through Social Representations Theory (SRT). Developed by Moscovici in the 1970’s, SRT is used to account for how people encounter, interact, re-construct and disseminate scientific information among themselves and within social groups (Jaspal & Nerlich, 2014). Social representations function as a way for groups to form and are intrinsically tied to shared sets of values, beliefs, and ideas that form core meanings for that group (Jaspal & Nerlich, 2014). They are the stock of common-sense knowledge, beliefs, values and practices, consensually shared, that allow individuals to make sense of, engage with, and communicate about relevant social issues (Moscovici, 1984).

SRT is a complex, multi-faceted theory, and for the context of this study the macro level elements of the theory are considered the most relevant. At the largest level of construction, SRT posits that representations can be either hegemonic or polemic (Magioglou & Coen, 2021). Hegemonic representations are the ‘dominant’ representation, difficult to usurp: they are the ‘default’ social representation most individuals hold for that social object (Jaspal et al., 2013). Polemic representations are “open to contestation and reformation in everyday discourse” as they are the weaker, opposing representation for social objects, which exists to usurp and become the new hegemonic representation (Jaspal et al., 2014, p.114). In the context of ACC, the hegemonic representation is the consensus, science-based view of climate change, i.e., that it is a real and human driven phenomenon, whilst the polemic representation of ACC is the denialist view: that climate change is either not a real occurrence or that it is not caused by humans (Jaspal et al., 2013). Both hegemonic and polemic representations are constructed through ‘core’ and ‘peripheral’ elements (Jaspal et al., 2016). The core of the representation is the nigh unchangeable, wholly defining aspect without which the representation would not exist (Jaspal et al., 2014). Peripheral representations are contextual, descriptive, and give the core a semantic and malleable representation within a group’s representation of the core (Jaspal et al., 2014). Peripheral elements are context dependent, sometimes contradictory, are used to defend against or attack opposing representations and they can be abandoned when no longer needed to define the core representation (Jaspal et al., 2013). Core and peripheral elements combined create shared social representations and are the tools for how representations adapt when confronted with new information (Jaspal et al., 2013).

Literature Review

Extreme Weather Events and Representations of Anthropogenic Climate Change

EWEs are increasing in their frequency and severity, with ACC being cited as one of the leading causes (Hamilton et al., 2016). Jaspal and Nerlich note there has been “a shift towards attributing extreme weather events to climate change” (2014, p.6). The impact of EWEs on views of ACC is well established, with similar findings found across multiple studies (Howe, 2021). One common finding is that EWEs increase agreement with consensus-based views of ACC (Howe, 2021; Kim et al., 2021; Roxburgh et al., 2019; Wibeck, 2014). Roxburgh et al. (2019), used social media to explore how three hurricanes in the U.S. affected perceptions of ACC, and found that during and after the EWEs consensus views dominated the discourse surrounding the cause of the hurricanes. This result has been found across numerous studies which suggests EWEs allow individuals to ‘see’ and engage with the immediate impacts of ACC, which is normally felt to be a distant and abstract concept (Howe, 2021; Wibeck, 2014). The effect of EWEs on ACC perceptions can be so strong that individuals do not have to directly experience the event for them to accept a consensual representation of ACC, they need only link the cause of the event to ACC for it to increase agreement with consensual representations (Broomell et al., 2015; Ogunbode et al., 2019; Rudman et al., 2013). However, it should be noted that the majority of studies exploring consensual perceptions have only used UK or U.S. participants. Gaymard et al., (2015) demonstrated that different geographical areas and populations can form different consensus-based representations of ACC and emphasise the importance of exploring these ideas within multiple different cultural contexts, and not just focus on UK or U.S. normed representations.

Roxburgh et al.’s (2019) study referenced another effect EWEs have on ACC perceptions: *reducing* denialist perceptions. Evidence for this is less established than the

consensus effect, but is growing (Bednarek et al., 2022). Fownes et al. (2018), discovered a decrease in denialist-based views following multiple EWEs worldwide, involving a reduction in the volume of denialist rhetoric, and content shifting away from inflammatory anti-science views. A common explanation for this sudden reduction in denialist views is “highly uncommon conditions will soon be the new normal, with common occurrences of even more extreme conditions”, meaning the increasing frequency and severity of EWEs makes denialist arguments unbelievable for individuals (Kirilenko et al., 2015, p. 98). Hamilton et al. (2016) hypothesised that as these events impact more areas, denialist views will naturally disappear as individuals will no longer be able to ignore the effect ACC is having on the ever-increasing atypicality of these EWEs. However, research into the impacts of EWEs on denialist representations often neglect to explore how such events are actually impacting the polemic representation, tending to only look at numerical reductions in the volume of denialist rhetoric surrounding the EWE (Ogunbode et al., 2019). The literature on *how* polemic denialist representations of ACC are qualitatively altered due to EWEs is therefore lacking.

Studies investigating the ACC-EWE link do not always produce homogenous results. There are differing theories on whether the effects EWEs have on ACC perceptions are short or long term (Hughes et al., 2020). Multiple studies suggest that the effect of EWEs increasing consensus-based perceptions diminishes over time (Hughes et al., 2020, Rudman et al., 2013). Others, such as Howe (2021), argue that the type of EWE matters most, and that atypical or long-term events are more likely to result in changed perceptions, a view supported by other research (Hamilton et al., 2016; Hughes et al., 2020; Kim et al., 2021).

The impact of EWEs on ACC perception may not be definitive either. Most studies that examine it find political ideology has a greater influence on peoples’ views of ACC, above that of experiencing EWEs (Doue et al., 2020). Hamilton et al. (2016), commented that

right-wing, conservative leaning individuals were universally less likely to believe in or endorse consensus-based views of ACC, even if they personally linked the severity of flooding in the North-Eastern U.S., where the participants lived, to climate change.

Numerous studies corroborate this, detailing that political ideology, with left-leaning people favouring consensus views and right-leaning denialist views, has a stronger influence on ACC perceptions than EWEs elicit (Roxburgh et al., 2019; Spence et al., 2012).

Social Media and Anthropogenic Climate Change

A popular way to explore perceptions of ACC is through social media. Social media is a “discursive melting pot” (Berglez & Al-Saqaf, 2021, p.383), and websites such as Twitter have become favoured by researchers for the variety of easily accessible social data available (Fownes et al., 2018). Cody et al. (2015), elaborate by explaining how Twitter is excellent for gathering ‘social snapshot’ data about a variety of topics due to its diverse user-base and the publicly available nature of most of the site’s content.

Many studies on ACC have utilised Twitter data to determine how EWEs influence perceptions of ACC (Fownes et al., 2018; Roxburgh et al., 2019). The use of Twitter data allowed a previously unattainable level of temporal proximity to the impact of EWEs on perceptions of ACC as users were able to broadcast their consensual or denialist viewpoints of ACC before, during, and after the event (Berglez & Al-Saqaf, 2021).

Social media sites such as Twitter have also been used to explore how individuals’ and groups construct representations of ACC (Kirilenko et al., 2015). Most of this research has focused on constructions of denialist representations, as they are commonly over-represented in social media samples compared to real life (Cody et al., 2015). This over-representation may stem from websites like Twitter being easily accessible places for people to form ‘counter-public’ groups (like ACC denialism), where they can easily insulate

themselves from externally invalidating information (Bednarek et al., 2022). This research area has produced several dominant findings.

First, denialists are aware of the polemic nature of their representation and consequently, construct their arguments in a ‘good faith’ manner (Koteyko et al., 2013; Reed, 2016). This positions their representation as socially and scientifically acceptable, denialist arguments are merely ‘asking questions’ or engaging in proper scientific scepticism (Jang & Hart, 2015). Within the last half decade this denialist representation has shifted in favour of the second key finding, that of denialists repeatedly representing ACC as part of the ‘culture war’ (Reed, 2016). The ‘culture war’ is a vaguely defined term used to encompass the growing discontent and animosity between political groups that aligns social and scientific issues with support for different political ideologies (Reed, 2016). Denialist representations of ACC as a global conspiracy or a left-wing political issue gained immense traction online after the ‘Climategate’ scandal of 2009 (Koteyko et al., 2013). It gained further prominence with the rise of hard-right politics such as the U.S. Trump administration (Roxburgh et al., 2019). Linking ACC to political ideology is also a de-legitimisation strategy as it frames climate change as a political stance that individuals can disagree with (Koteyko et al., 2013).

Studies that examine consensual ACC representations on social media find similarly cohesive results (Wibeck, 2014). One consistent finding is that perceptions of ACC centre on the idea of affirming and supporting climate sciences (Kirilenko et al., 2015; Roxburgh et al., 2019). Kirilenko et al. (2015), concluded that the act of repeating and sharing consensus-based messages of ACC was used to signal and strengthen individual’s own self-perceptions of their support of consensus views of ACC. Roxburgh et al. (2019) expanded on this by demonstrating how people’s support of climate sciences and by extension the hegemonic representation of ACC, increased during EWEs through the sharing of science articles and ridiculing and disproving denialist representations of ACC. Consensus-based representations

also seem to focus on ideas of adapting to ACC and of new or future technologies being used to 'solve' ACC (Camarillo et al. 2021).

Social Representations Theory and Anthropogenic Climate Change

Studying representations of ACC has limited explanatory ability without a theoretical framework. SRT is therefore used by a multitude of researchers for its robust and deep exploration of social representations (Smith & Joffe, 2012). Studies utilising SRT, sometimes using social media data or in the context of EWEs, have found similar results for consensus and denialist representations of ACC (Atzori et al., 2019; Jaspal et al., 2013; Roxburgh et al., 2019). The most common finding is that the hegemonic representation of ACC is undoubtedly the consensus-based approach (Jaspal et al., 2014). More pertinent is the commonly found core and peripheral elements that make up the hegemonic representation. One common peripheral element is of ACC being temporally and physically distant from consensus view holders, particularly in Western countries (Nerlich & Jaspal, 2014; Wibeck, 2014). This representation is discarded when individuals are shown the impacts ACC can have on their environment, including EWEs (Wibeck, 2014). This is in contrast to denialist representations, which seem to shift from peripheral elements of questioning science to equating ACC with socio-political issues when confronted with disconfirming information (Doue et al., 2020; Roxburgh et al., 2019). Hegemonic representations also use peripheral elements related to scientific certainty and future technologies to offset feelings of uncertainty or concern about the future (Camarillo et al., 2021).

Literature Gap

Many of the limitations of ACC representational literature comes not from methodological or theoretical critiques, but from gaps within the literature. Studies such as Gaymard et al. (2015) and Wibeck (2014) explored how different countries have differing social representations of ACC. Focusing on the limited research conducted in Australia, it

appears that ACC representations, both consensus and denialist, differ from U.K. and U.S. constructions (Bednarek et al., 2022; Hughes et al., 2020; Mayes & Hartup, 2021) .

Australian representations focus on who is ‘responsible’ for ACC and the economic costs of acting on a supposedly not definitively proven phenomenon (Mayes & Hartup, 2021). In contrast, U.K. and U.S. representations are dominated by conspiracy theories, ‘culture war’ attitudes and outright denial of the existence of climate change (Lynam, 2016). Further research is needed within an Australian context to better define Australian representations of ACC and how they compare globally.

Moreover, the Black Summer Bushfires were a monumental event for Australians and the world more broadly, in terms of how ACC is affecting the weather. The bushfires become somewhat of a ‘watershed’ moment for permanently shifting representations of ACC within Australia (Bednarek et al., 2022; Linnenluecke & Marrone, 2021; Oldenborgh et al., 2021). Despite this, only a limited number of studies specifically investigating the effect of the Black Summer fires on representations of ACC have been conducted, with few tangentially related to representations of ACC in favour of investigating the effects of disinformation and misinformation on peoples’ representations of the fire or assessing if the fires caused an increase in (Bednarek et al., 2022; Weber et al., 2022). More research for this EWE and its effects on Australian representations of ACC is therefore warranted. Through SRT, a deeper understanding of the nature of Australian representations of ACC can be achieved by exploring how the hegemonic and polemic representations were constructed and utilised before the bushfires, and how these representations were altered at a qualitative level by the advent of this EWE.

The Present Study

The purpose of this current study is to explore how representations of anthropogenic climate change were changed in Australia during the Black Summer Bushfires. SRT will be

employed to help elucidate how representations of ACC are constructed, change, and interact with their hegemonic or polemic opposites. In particular, I will focus on how hegemonic and polemic representations are constructed, how core and peripheral representations are presented, and how they are used to interact with other representations. To that end, Thematic Analysis (TA) will be used to explore social representations of ACC in a sample of tweets that discuss the Black Summer Bushfires. Multiple studies using SRT have also used TA due to the applicability of themes to the core and peripheral representations of social objects (Fischer et al., 2012; Nerlich & Jaspal, 2014; Smith & Joffe, 2012). Twitter data will be gathered from Australian-based users at two separate time points, August and January, representing the time immediately before the bushfires and during their peak. This allows for an analysis of the most dominant consensus and denialist representations before and during the fires to explore how these representations changed when Australians on both sides of the representational spectrum were confronted with the consequences of climate change.

Purpose

The aim of the present study is to explore changes in social representations of ACC *during* EWEs. This exploration will help shed light on how holders of different representations of ACC react to these events, thereby providing insight into how policy and communication around ACC can be targeted to accommodate the shifting nature of representations of ACC.

More broadly, this study aims to add to the growing evidence-base that EWEs like the Black Summer Bushfires have become a ‘turning point’ for changing social representations of ACC (Hamilton et al., 2016; Linnenleucke & Marrone, 2021). Such environmental disasters have become so severe that some research has posited that these events are creating a permanent shift in representations of ACC, as denialists find it increasingly difficult to hold

onto their polemic representations when confronted with the consequences of a human caused climate changing world.

Methods

Conceptual Framework

A critical realist framework was used to explore social representations of ACC before and during the bushfires. Critical realism “combines a realist ontology (there is something real to find out about) with a relativistic epistemology (different people will come to know different things in different ways)” (Stutchbury, 2022, p.113). This framework was chosen due to the sensitivity of the representations being explored. It is important to not denigrate people’s views about ACC but to be mindful and remember that while reality is objective, perception is subjective (Stutchbury, 2022). From their own perceptions, people holding denialist views are correct and the consensus view is wrong (Atzori et al., 2019). In utilising critical realism this study takes the objective stance that ACC is real while acknowledging and respecting the differing subjective viewpoints of denialist views about ACC.

Procedure

Data Collection

The study utilised data sourced from the social media site Twitter. Twitter is a popular microblogging site where users ‘tweet’ messages of 280 characters or less (Bednarek et al., 2022). Users may also ‘retweet’ messages posted by others, sharing these on their own account, and is generally considered as a way of affirming or supporting the original tweet’s content (Fownes et al., 2018). Twitter is known as an online congregation point for people to espouse non-socially conforming viewpoints such as ACC denial (Fownes et al., 2018). For this reason, Twitter is used by researchers to gather large quantities of data on a wide variety of social issues (Cody et al., 2015).

Screening and selection for tweets was conducted under two criteria. First, only tweets originating from verified Australia-based accounts or with geo-location tagged to Australia were admitted. Whilst there was considerable international attention towards the bushfires, a worldwide analysis was beyond the scope of the current study. Second, applicable tweets for this study were selected using four key words. These were ‘climate change’, ‘#climatechange’, ‘global warming’, and ‘#globalwarming’. These are the most commonly used terms to refer to ACC. ‘Global warming’ terms were included as they are commonly used by denialists (Jang & Hart, 2015). In addition, past research indicates that a preference for the term ‘global warming’ persists on social (Jang & Hart, 2015; Mayes & Hartup, 2021). Screening criteria which included popular denialist term increased the chances of gathering consensus and denialist tweets containing representations of ACC.

Screening for tweets mentioning climate change was conducted via Twitter’s Premium Search Tweets API: Full Archive software. This allowed for the screening of all possible tweets that are included within set criteria (see below). The ‘R’ statistical program package ‘Rtweet’ was interfaced with the API archive to collate and screen all relevant collected tweets (version 0.6.9; Kearney, 2019). A fork was incorporated into the program package to amend issues that arose during its use (Taylor, 2019).

In keeping with recommendations from the British Psychological Society (2021), ethics approval was not required for this study as the data was accessible via a publicly available website and therefore in the public domain.

Two time periods were selected for data collection: 2019, August 25-31 and 2020, January 5-11. August dates were selected as it is the closest time period available before the fires began in September, allowing analysis of ACC representations unaffected by the advent of the fires but still within a similar time period to allow for a valid comparison (Jalaludin &

Morgan, 2021). January dates encompassed a period during the height of the bushfires and coincided with several important events such as the return of the Australian Prime Minister from a Hawaiian holiday and the release of an Australian Federal Police report disproving the popular theory that the majority of fires were caused by arsonists (Bednarek et al., 2022; Weber et al., 2022). Bednarek et al. (2022), further detailed this period corresponded with some of the highest levels of traditional and social media activity relating to the bushfires in Australia.

The data collection process began once all the aforementioned parameters had been set and returned thousands of results for each time frame. Even when excluding for retweets through the 'R' package, the data corpus was larger than required for the scope of the study. Consequently, a random sampling of 500 tweets from both the August and January data pool was performed within 'R'. This resulted in 1000 individual tweets from both time periods, later reduced to 999 after a replication error was discovered in the August dataset.¹ Final counts stood at 499 tweets in August and 500 in January. Once this data had been finalised in 'R' it was exported as a converted excel file before being downloaded into the Nvivo12 data coding program (QSR International, 2020) for the initiation of the thematic analysis.

Reflexivity

Researcher reflexivity was essential throughout the analytic process due to the highly politicised nature of representations about ACC. My own view is that ACC is a real phenomenon, requiring immediate action from governments, businesses, and individuals. Utilising a critical realist paradigm helped ensure my analysis of denialist tweets was framed as their own subjective reality and not derided as factually incorrect. My personal thoughts, notes, and ideas while conducting the analysis were recorded in an 'audit trail', which I

¹ In keeping with Tracey's (2010) guidelines for qualitative research integrity, the data was not resampled to gather a new dataset of 500.

frequently reflected on and discussed with my supervisor to ensure I was able to keep an objective as possible mindset while reading and coding the data (Tracey, 2010).

Data Analysis

An in-depth thematic analysis was conducted on the two accumulated datasets in-line with the six-step process outlined by Braun and Clarke (2006), where thematic analysis is defined as “a method for identifying, analysing and reporting patterns (themes) within data” (p.79). A deductive approach was initially taken in which the two datasets were coded according to pre-existing framing templates: ‘consensus views about ACC’ and ‘denialist views about ACC’. Tweets were divided into these frames based upon their content, with a third frame appearing for tweets that could not discernibly fit into either aforementioned category which were excluded from further analysis. This process resulted in four distinct data sets which were then coded and analysed as separate data sets (see figure 1. Below).

Figure 1.

Four datasets based on time period and deductive coding.

August Consensual	August Denialist
January Consensual	January Denialist

After the initial deductive coding, an inductive thematic analytic approach was employed. This was an iterative process involving continual reading and re-reading of each dataset and coding based off individually significant concepts within each tweet. This eventually produced dozens of codes formulated around repeated concepts within the data.

Each dataset's coding structure was refined multiple times to ensure analytic rigour (Braun & Clarke, 2006; Tracey, 2010), resulting in 87 codes for August and 142 for January.

The generation of themes was accomplished by first splitting up every code among consensus and denialism as some codes, such as 'ACC as a socio-political issue' contained tweets from both representations. Once coding was finalised, all codes were printed onto paper to facilitate the visual and manual grouping of codes. Codes were assembled into groups based upon semantic and contextual similarity. This formed the basis of theme and sub-theme developments for each core representation across August and January (see figure 1). Further refinement was conducted to develop a cohesive representation of the predominant patterns in the data corpus. Two thematic maps (see below) were produced to represent the overarching themes and sub-themes developed.

Results

Thematic Analysis produced 17 themes; three denialist and five consensus themes in August, and four denialist and five consensus themes in January (see figures 2 and 3, and Appendix for detailed thematic maps). These themes were analysed to explore the core of the representations for both denialist/polemic and consensual/hegemonic social representations of ACC across August and January.

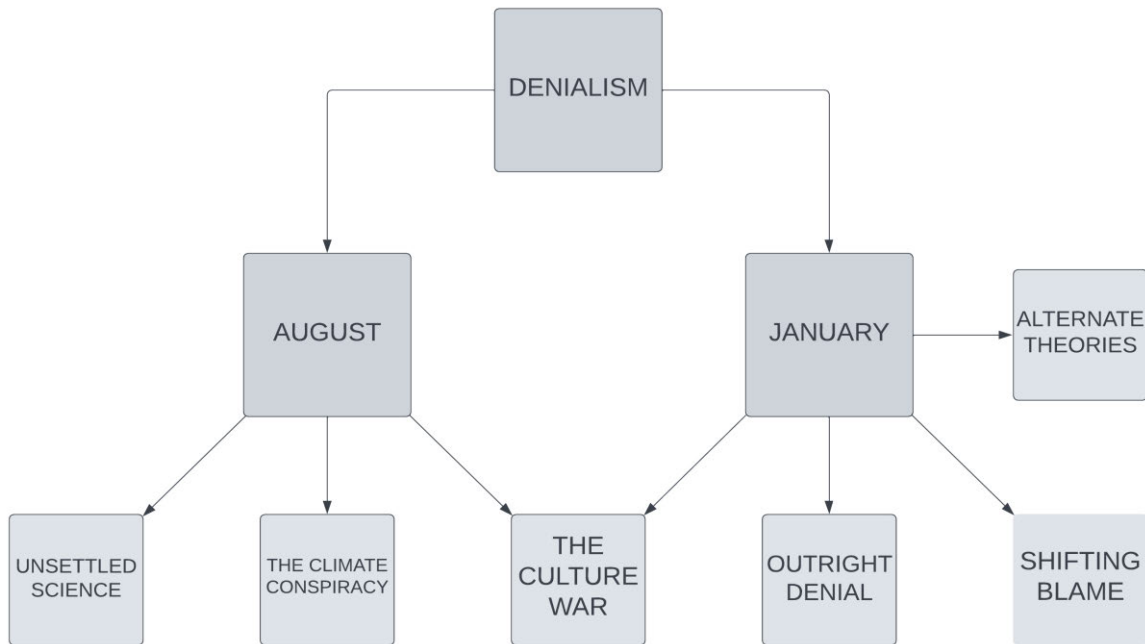
Denialist/Polemic Representations of Anthropogenic Climate Change

As seen in the thematic map below (figure 2), there were largely different dominating themes (social representations) present in August and January. August themes centred on commonly identified major facets of ACC denialism and largely mirrors previous research in that denialist representations focused on the inaccuracy of climate sciences and portrayed ACC as a socio-political issue. January denialist themes are less unified, with Outright Denial and The Culture War representing continuing August representations of denialism while Alternate Theories and Shifting Blame brought into dominance denialist representations of

climate change as a natural phenomenon, a representation which was barely present in August.

Figure 2.

All major denialist themes generated. 'The Culture War' was an important theme across both months.



August Denialist/Polemic Representations

Three themes were developed from denialist-based tweets during August; Unsettled Science, The Climate Conspiracy and The Culture War. These major themes identified dominant denialist representations of ACC on Twitter. These can be understood as the science of ACC is inaccurate and fraudulent (Unsettled Science), part of a wider conspiracy to convince people ACC is real for various reasons (Climate Conspiracy), and that ACC is an ideological issue within an increasingly politically antagonistic world (The Culture War).

These three themes serve dually as core representations of denialism and as peripheral, supporting elements of other representations when needed. The functional utility of these representations is evident as they shift from core to peripheral elements when

necessary to serve the polemic denialist representations' efforts to usurp the hegemonic representation of ACC. In tweet August #78:²

You're wrong. Deniers base all their judgements on science & there's tonnes of it. Anthropogenic climate change is being debunked by science every day. Even the IPCC has admitted fudged climate modelling, fraud & less warming than predicted. (Aug. #78).

The core denialist representation of ACC is Unsettled Science, with ideas of fraud (i.e. conspiracies) serving as peripheral, supporting elements. In other denialist tweets, the representational roles reverse, such as August #60:

Haha and Obama just spent \$15 million on beach front property. Hmmm does not sound like someone who is scared of rising sea levels. Global warming is a scam to tax poor working class people. (Aug. #60).

The core denialist representation is ACC being a conspiracy, with the 'inaccurate' science of rising sea levels serving a peripheral, explanatory role. The ease in which holders of denialist representations utilise these in different contexts indicate a well-functioning, competent polemic representation. Social representations that are fragmented or exceedingly contradictory struggle to assert their hegemonic dominance, thereby allowing strong polemic representations to assert a convincing opposing view (Castro & Batel, 2008; Jaspal et al., 2014). This may be the case for the polemic, denialist representations in August. Denialists appear well versed in all major elements of the polemic representation and use them to effectively establish their representation as a valid opposing view and to attack the core of the hegemonic representation, particularly the validity of climate sciences.

² While APA7 style requires that quotes fewer than 40 words should be embedded within the text, given so many of the tweets are less than 40 words, I have chosen to present them in block formation for the purpose of readability and clarity.

Another core facet dominating denialist representations in August is how ACC is overwhelmingly an ideological, and not a scientific, issue. Denialists have intrinsically tied ACC to socio-political ideology to advance their representation (McCright & Dunlap, 2011). This serves two purposes. First, as a delineation point between those who hold denialist representations and those who hold hegemonic representations. Second, it forces consensus holders to engage in ‘culture war’ debates which infuse ACC with socio-political issues. This can be seen in Tweet August #343:

MOST Western democracies, tired of decades of failed #Socialism, are electing conservative governments who are non climate-hysterical. BUT yes, somehow, draconian U.N. #ClimateChange edicts seep through every time, everywhere. (Aug. #343).

This tweet demonstrates how ACC is represented as an ideological issue, with conservative politics represented as the rational, preferable alternative against “draconian”, ACC supporting “socialist” governments. The author never represents ACC as a scientific issue, instead firmly representing it as a political issue which forces those who engage against polemic representations to also address ACC as a socio-political issue. This leads into the second purpose of representing ACC as a political issue; the delegitimisation of climate sciences. By consistently framing representations of ACC as ideological, denialists ‘de-fang’ the hegemonic representation of the validity of climate sciences. This ideological representation of ACC helps advance the polemic representation by limiting the effectiveness of one of the core elements of the hegemonic representations of ACC.

In August, polemic representations of ACC were cohesive and well understood by its holders. Denialists utilised their representation of ACC as a socio-political issue to good effect in ‘muddying the waters’. In doing so they avoided a weakness of the polemic representation in not being able to argue scientifically the illegitimacy of ACC theories and

instead advanced their own representation and delegitimised the hegemonic one through representing ACC as a socio-political issue. This suggests during August the polemic representation of ACC was strong and unaffected by the domination of the hegemonic representation of ACC.

January Denialist/Polemic Representations

While denialist themes in August identified the polemic representation as stable and able to present itself as valid opposition, denialist themes generated for January reveal the polemic representation in a state of flux. It is evident that the disillusioned state of denialist representations in January is due to the advent of the bushfires. Four themes were developed, which demonstrate the fragmented nature of the polemic representation caused by the fires. Outright Denial and The Culture War are familiar themes, representing ACC simultaneously as fictional and an ideological issue. However, two new representations appear. Themes Alternate Theories and Shifting Blame represent a defensive shift for the polemic representation, as denialists attempt to explain the occurrence of the fires as not related to ACC, while simultaneously conceding the existence of climate change, though still challenging the idea of it being anthropogenically driven.

These two newly dominant themes, illustrate how the polemic representation attempted to defend its core function of denying ACC while recognising the bushfires as a severe representational threat. The unprecedented size and destruction of the fires, and the continual listing of ACC as a primary cause of them, threaten the core denialist representation that ACC is not real. Shifting Blame defines a common peripheral, defensive representation explored through SRT. This theme encompasses representations of the bushfires being caused by multiple catalysts *not* related to ACC. Particularly prominent sub-themes within this representation are the fires were caused by arsonists or by far left-wing policies preventing

ecological management. January tweets #86, which refers to British news commentator Piers Morgan, and #122 demonstrate this:

Look at this fat pig! As usual, uneducated knob-heads like this arrogant Pom blame climate change for what happening in Australia. The arsonists and greens party stopping burn offs and proper land management are to blame here!!! (Jan. #86).

The #greens #left #labour #MSM and #Climatechange #ClimateEmergency believers being put in place by @ScottMorrisonMP when they realize the truth #arsonists #fuelload #backburning restrictions and failed greens policies are the cause of these fire storms threatening Australia. (Jan. #122).

The authors' of these tweets attest that ACC had no impact on the bushfires, and both authors simultaneously blame arsonists and failed ecological policies, while also peripherally linking these failures to socio-political issues. These tweets emblemise the denialist defensive peripheral representations of their polemic core. The assertion of non-ACC related causes is a defence against hegemonic representations asserting the ACC-bushfire link and a 'rallying call' for polemic representation holders to use these representations in defence of their core beliefs. So long as it can be argued that the fires were not caused by ACC, the core denialist representation remains secure. However, there is another, new denialist representation that demonstrates a significant deviation from the established polemic stance in August; Alternate Theories. This theme comprises a newly dominant denialist representation; an acknowledgement of the existence of climate change, but softening this admission by asserting the phenomenon to be a natural occurrence and not as dangerous as hegemonic holders believe. January tweets #49 and #253 highlight this 'natural climate change' representation:

Meaning *wink wink nudge nudge* background climate change (as in, oh climate change has always happened, it's natural, leave it be), not anthropogenically forced climate change. (Jan. #49).

No she's a greenie who believes in MAN MADE global warming. Murdoch's media is refuting it which is their right. There is STILL no hard evidence that our CO2 emissions, all 0.04% or less of them of the earth's atmosphere is behind global warming. Your belief doesn't make it true. (Jan. #253).

Both tweets emphasise the delineation between “man-made” and natural climate change. This representation is a significant break from polemic representations present in August as during that period there was almost no mention of natural theories of climate change, its very existence was dismissed entirely. Now in January, there is a significant representation of advocating for natural theories of climate change. From this, it can be suggested that the bushfires, and the visceral evidence of ACC playing a large role in creating and sustaining them, forced the polemic representation to fragment, adapt, and defend against this new representational threat. Where there was rigid adherence to outright denial of ACC, now exists a concession to consensual ideas that there is some form of climate change. This is a severe destabilisation of a once cohesive polemic representation. The newly dominant denialist representations of Shifting Blame and Alternate Theories break with the cohesive denialist representations in August, and demonstrate the immense impact and the Black Summer Bushfires had on some holders of the polemic representation.

However, polemic denialist representation did not fracture entirely due pressure from the bushfires. Themes Outright Denial and The Culture War inform familiar denialist representations, but change motivated by the bushfires has occurred here also. Some holders

of the polemic representation ‘doubled down’ and denied the existence of any form of climate change:

You were going great until point 2, sorry to inform ya mate the climate change thing is a hoax, you must do your own research. (Jan. #27).

Alternatively, others still represent ACC as an ideological issue, and choose to push their representation in that form:

Arson is not "climate change" Despite what the loony Climate change cultists and corrupt leftie politicians like to say. (Jan. #112).

The author here states belief in ACC is ‘cult-like’ and only perpetrated by left-leaning individuals. Representations such as these demonstrate the continuation of some elements of the polemic representation from August. Even with these continuing representations, change has been noted. The way in which outright denial is no longer intensely tied to conspiracy theories is indicative of the less aggressive and assertive nature of the polemic representation during January as it is no longer making widespread use of one of the favoured tactics of attacking hegemonic ideas which was so prevalent in August.

Bringing these various findings together, it is clear that during January, the polemic representation was in a state of upheaval and reorganisation from the critical representational threat of the bushfires. To confront this, the polemic representation took two differing defensive representational styles. Some representations ‘doubled down’ and kept the insistence of outright denial, while others shifted from standard polemic representations, and moved closer to consensus-based representations by conceding that climate change may be real, albeit in a ‘natural’ form.

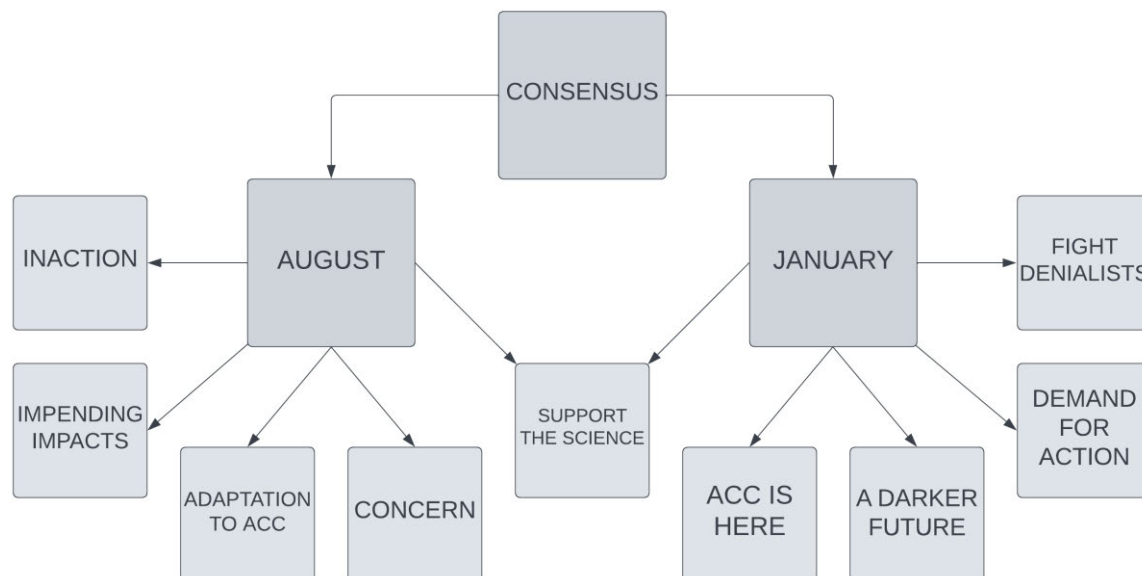
Consensus/Hegemonic Representations of Anthropogenic Climate Change

The thematic map below (figure 3) gives an overview of all major consensus themes generated in both months. August themes largely centred on the future threat of ACC, how

little was being done to address it, and the potential for science to help with adapting to the threat. Very little of these themes continue into January, which is dominated by themes of ACC finally ‘arriving’ in full force, anger at denialists and government for their continued disbelief and inaction, and worry that this EWE signals the beginning of worsening climate impacts to come.

Figure 3.

All major consensus themes generated for August and January. While there is some similarity between the two months, January themes are much more cohesive and more action oriented social representations.



August Consensus/Hegemonic Representations

Five themes were constructed to explore the dominant consensual social representations of ACC in August. These were Concern, Inaction, Impending Impacts, Adaptation To ACC, and Support the science. These themes portray different peripheral and core consensus representations during August, These representations are ACC is simultaneously a fast approaching, critical threat that is not being properly addressed, while

also a phenomenon which could be halted or adapted to, using a variety of future scientific inventions or discoveries.

The themes that best encapsulate one of the core consensual representations is Concern, with Impending Impacts and Inaction acting as peripheral elements that function as explanatory, defensive, and offensive representations against polemic representations. The functional system of core and peripheral elements representing the great concern ACC causes is visible in several consensual tweets:

Those are very weak points in the context of #climatechange. We are told by scientists we have 12 yrs. We must DE-grow & live within the capacity of the planet to provide for 7bil. Western consumers like us "need" less, not more. (Aug. #6).

My grandchildren & I will be asking our State & Federal governments to take climate change seriously. To consider the consequences of damaging fires, low water supplies, coastal erosion. We'll be asking for long-term planning for increased population caused by climate asylum... (Aug. #27).

Both authors' messages contain core representations of concern about ACC, and utilise different peripheral elements to exemplify and explain it. The first, #6, expresses concern over inaction about the impending impacts of ACC while #27 references the numerous predicted ecological consequences of ignoring ACC. It is evident that consensus holders are able to effectively combine different representations to emphasise and elevate their message, which is to express concern and warn people of the dangers ACC poses.

This dominant representation of concern, exacerbated by inaction and impending impacts of ACC, utilises another peripheral representation, Support The Science, as a common acclamation when defending their representation from denialists. However, this peripheral representation is also used for another, somewhat contradictory, dominant

consensual representation, Adapting To ACC. This encompasses ideas of learning to live with ACC, ways to mitigate its impacts, or how future technologies will be able to fix or reverse ACC. For example, tweet August #301, asks if hypothetical Australian solar farms are considered newsworthy given they may be the “solution” to ACC:

Is this newsworthy? Outback sunlight powering Singapore. Export revenue. Zero carbon emission energy = the solution to climate change, the existential threat facing mankind. (Aug. #301).

This is an example of how some hegemonic holders have looked to science to adapt to, and potentially halt, the effects of ACC.

These two major facets of the hegemonic consensual representation of ACC demonstrate the typical functioning of the representation in August. In essence, the consensus representation is rather idle, as it is not actively asserting itself against polemic representations present in August, nor is it effectively advocating for action towards ACC, instead being pre-occupied with the future impacts of the phenomenon instead of what is occurring in the present. However, it is still undoubtedly the hegemonic representation; evidenced by the number of consensus-based tweets and prior research detailing how the consensus view of ACC is the dominant representation worldwide (Jaspal et al., 2013; Jaspal et al., 2014). All major representations either concern themselves with future potentialities and impacts regarding ACC, or consider how it can be adapted to or solved through science. These two major representations emblemise the idleness that characterises consensus views in August. People are aware of the approaching danger of ACC, yet placate this concern and fear with hope and musings that ACC is something that can be adapted to, or even more optimistically, halted by some future saviour technology. This amalgamation of representations is demonstrated by August #415:

We're already hurting from the impacts of climate change. If we don't act now to transition fairly and swiftly away from coal, oil & gas to 100% renewable energy for all, this will only get worse. But it's going to take all of us working together to succeed. (Aug. #415).

January Consensus/Hegemonic Representations

While the bushfires had a destabilising effect on denialist representations, the opposite was true for consensual representations, with the fires galvanising them into action. The fires invigorated the hegemonic representation to better assert itself, while also attacking and disproving misinformation from the polemic representation. The new, assertive nature of the hegemonic representation was detected through three themes, ACC Is "Here", Demand For Action, and A Darker Future. The new offensive and defensive peripheral elements of the hegemonic representation which sought to further destabilise polemic representations were demonstrated through themes of Fighting Denialism and Support The Science.

The first three themes portray combinations and changes of familiar consensual themes from August. Consensus representations of Concern, Inaction, and Impending Impacts have transformed into the new consensus representations; ACC Is "Here", A Darker Future, and Demand For Action. January tweets #3, #23, and #150 portray a mixture of all three elements:

We apologise, our government has merely begun the apocalypse so business as usual here. Vote liberal #NLP #AustralianBushfire #celestebarker #ClimateChange #AuthorsForFireys. (Jan. #3).

@ScottMorrisonMP Asking respectfully on behalf of quiet & loud Australians: Please act on #ClimateChange. Not lip service, not obfuscation, not acknowledgement. Real Action:

-Transition from coal to renewables

-Commit to emissions reduction

Let #AustralianBushfireDisaster not be your only legacy. (Jan. 23)

Got to say, I find it hard to believe we will pull through because it's less about unprecedented fires and more about climate change. I find it hard to see a way this continent will be inhabitable by the 2030s. It's going to even make nz hard to live in during fire season. (Jan. #150).

These representations, visible throughout the above tweets, demonstrate the more active nature of the hegemonic representation in January. The fires have ignited consensus holders' desire to demand action to address ACC. They use the existence of these bushfires as incontrovertible proof that ACC is no longer an issue for future generations. The consensus representation is one of recognising ACC is already 'here':

...We are seeing problems that were predicted a decade ago showing exactly as predicted. The Aus Govt commissions a report from Ross Garnaut and it predicted fires would be noticeably worse, due to climate change by 2020. (Jan. #1).

This is a major shift in the functioning of consensus representations from August. The fires are a catalyst to motivate major action and increased functionality from the hegemonic representation, to inspire and demand from institutional and political bodies action at addressing the ever-more present danger of ACC.

During January, new offensive and defensive representations deployed by the consensus hegemonic core are visible. Holders of the hegemonic representation rigorously argued against denialist misinformation being spread on twitter:

It is climate change. None of the major fires were lit by arson, they were lit by lightning strikes and stoked by the hot, dry conditions because we've been in a long-term drought. Police have taken action against 183 people over illegal fires, 24 of which were arson related. (Jan. #141).

Tweets like January #141 symbolise this new peripheral representation of actively fighting against denialist representations and attempting to further destabilise the polemic representation by de-legitimising their attempts at shifting the cause of the fires away from ACC. This new consensual representation was boosted by an older consensus representation of Support The Science, which took on renewed vigour due to the bushfires. No longer was Support The Science used as a defensive peripheral element, it was now being used to suppress denialist representations:

Yes please look at the science, stop cherry picking, climate change is driving these dipoles in a way that is outside the normal as measured over decades and hundreds of years take your blinkers off. (Jan. #37).

This tweet characterises the dual uses of this representation. Within it contains demands to “stop cherry picking” while also explaining how ACC effected the fires. This defends consensus representations through supporting scientific validity while attacking denialist representations by highlighting their lack of scientific evidence. This contrasts with the hegemonic representation in August, which was static and solitary, engaging little with the polemic representation. It is valid to suggest that the bushfires were instrumental in restructuring the hegemonic representation from almost stagnated worry and concern over the future, to one that actively engaged and argued against the polemic representation, further destabilising it and preventing it from interfering with other consensual representations which were advocating their hegemonic message of demanding action for the present danger of ACC.

Viewing the hegemonic representation in January holistically, it can be seen the bushfires had the opposite effect compared to the polemic representation. As the polemic representation weakened due to the intense representationally destabilising pressure of the bushfires, the hegemonic representation grew stronger. It used the fires to spur more direct action out of its holders, who re-invigorated and adapted their core and peripheral representations of ACC more assertively than denialists did. This is due to consensus representations drawing on the fires to bolster their claims, where the fires could be used as physical evidence of and for the existence and dangerous impacts of ACC. This in turn provided a strong argument from the hegemonic representation to demand action for ACC. The same was not possible for the polemic representation, where any reference to the fires being caused by, or made worse by ACC, would only weaken the representation as a whole. Thus, while the fires served to make the polemic representation of ACC weaker, it strengthened the hegemonic representation.

Discussion

This study provides insight into how hegemonic and polemic social representations of ACC changed due to the Black Summer Bushfires. Rather than assess levels of consensual and denialist views before and after EWEs as previous studies have done, this study delved deeper into exploring hegemonic and polemic representations before and during the bushfires to understand how this EWE changed each representational stance. During the height of the bushfires, the polemic representation was strained. Holders of this perspective needed to restructure various peripheral elements, to cope with the severe representational threat that the bushfire-ACC link posed. Conversely, hegemonic representational holders were able to strongly assert and reorganise their peripheral representations more cohesively by using the bushfires as physical evidence for ACC.

Polemic Representations During Extreme Weather Events

This study provides new insights into the relatively unexplored area of how EWEs can alter denialist representations of ACC. Specifically, results suggest the bushfires caused severe strain on the polemic representation, with two antithetical representations emerging due to representational pressure from the fires. These were outright denial of the existence of ACC and that climate change was a naturally occurring phenomenon. Representations of Alternate Theories signal a shift towards acknowledging the existence of climate change among some denialists, with the caveat that climate change is a naturally occurring phenomenon being exaggerated by environmentalists and left-wing politics (Reed, 2016). This clashes with the other polemic representation; outright denial of climate change. However, the resurgent, almost opposite representation of natural climate change regained prominence due to the bushfires and caused significant destabilisation within the polemic core. Such findings, where denialist representations fracture when confronted by EWEs, are scarce in previous literature because they have not been a focus (Broomell et al., 2015).

However, that social representations can split and reorganise when encountering new, representationally unsettling information is not an unknown occurrence. Wibeck (2014), noted that holders of denialist representations would change peripheral elements when challenged with disconfirming information that invalidated their original representation. While this may appear as a weakness of polemic representations by not defending peripheral representations, it is actually a principle theory of SRT (Atzori et al., 2019). Social representations are not exact reproductions of information, and are instead shared common understandings that help contextualise information and reality, their contradictory and inconsistent nature is a reflection of their social functioning (Atzori et al., 2019). Indeed, the function of polemic representations is to resist the hegemonic, thus contradictory representations arise. Therefore, affirming the existence of natural climate change and

simultaneously denying the existence of any climate change, must co-exist for the express purpose of countering the hegemonic representation in any way it can (Castro & Batel, 2008).

The splitting of polemic representations due to the bushfires is still a relatively novel finding. This supports the hypothesis of Hamilton et al. (2016), which states that as EWEs become more atypical and impact more areas, peoples' disbelief of ACC will fade as they accept the role ACC plays in creating increasingly atypical EWEs. The fracturing of the polemic representation in January due to the bushfires may be an example of this.

Consensus Representations During Extreme Weather Events

It is evident the bushfires had a unifying effect on the hegemonic representations during January. Consensus-based representations increased in salience as many holders used the unprecedented scale of the bushfires as physical evidence for ACC (Bednarek et al., 2022). January themes ACC Is "Here", and Demand For Action emblemise consensual representations that the bushfires were a physical manifestation of ACC, and used this to demand action for ACC. During this period consensus representations centred on scientific validity and combatting denialist misinformation. This demonstrated the bushfires made consensus representations appear more valid, and hegemonic holders were using this validity to quell denialists' attempts at making the bushfire-ACC link a socio-political issue and not a scientific one (Bednarek et al., 2022; Weber et al., 2022).

These results have been noted in other research concerning the effect EWEs have on consensus-based representations. Multiple studies found that EWEs increase consensus-based representational rhetoric on social media and the salience of people's perceptions of ACC (Doue et al., 2020; Hamilton et al., 2016; Kirilenko et al., 2015; Roxburgh et al., 2019). It is thought the greater the atypicality of an EWE the more likely it is to be linked to ACC, as the phenomenon is already representationally linked to unusual, never-before-seen events

(Gaymard et al., 2015; Wibeck, 2014). The increased salience of the hegemonic representation may also be due to the bushfires occurring in a Western country (Nerlich & Jaspal, 2014). Hegemonic holders in Western countries tend to view ACC as spatially and temporally distant (Wibeck, 2014). However, when impacts are contextualised within their local environment, such as the bushfires affecting Australian communities, people are more likely to agree with consensus views (Moloney et al., 2014; Nerlich & Jaspal, 2014). Consensus-based representation holders are also more effective at advocating their views when explicitly linking EWEs to ACC (Moloney et al., 2014).

The changing hegemonic representations from August to January demonstrate linking EWEs to ACC increased the salience of consensual representations on Twitter, and made them more effective (Ogunbode et al., 2019). Consensus-based representations of the bushfires being evidence of ACC was particularly effective as it removed notions that the effects of climate change were only hypothetical, future concerns. This increased the salience of the hegemonic representation which had the effect of increasing agreement, and therefore support, of demanding action to address ACC (Chen, 2019). Additionally, holders of hegemonic representations were able to effectively argue against polemic representations citing other causes for the bushfires. This weakened the polemic representation, and demonstrated that by using strong, non-abstract evidence for ACC, it is possible to increase the effectiveness of hegemonic representations while reducing the effectiveness of the polemic representation, which relies on the generally abstract and difficult nature of ACC evidence to cast doubt on its overall validity (Broomell et al., 2015). In being more cohesive and assertive through using applicable EWEs as evidence for ACC, hegemonic representations can better advocate for actions towards ACC while simultaneously weakening denialist representations seeking to stall mitigation efforts.

Anthropogenic Climate Change and Ideology

A representation found throughout August and January is ACC being an ideological issue. This is common throughout research on consensual and denialist representations (McCright & Dunlap, 2011; Roxburgh et al., 2019). Denialist themes, The Climate Conspiracy, and The Culture War centre on representations of ACC as a political issue; belief in climate change is associated with left-wing socio-political views (Fischer et al., 2012). Within the hegemonic representation the theme Fighting Denialists represented ideas of delegitimizing denialist representations by decoupling the scientific phenomenon of ACC from socio-political issues.

Linking ACC to political ideology is well evidenced in previous research (Koteyko et al., 2013; Reed, 2016; Roxburgh et al., 2019). Much of this focuses on how denialist representations rely on linking politics to ACC as the basis for their arguments (Chen, 2019; Olausson, 2011). It is theorised denialists utilise this representation to avoid engaging in proper scientific discourse, something denialist representations struggle with (Jang & Hart, 2015; Roxburgh et al., 2019). Consensus representational holders also link ACC to political issues by referencing ACC among other socio-political issues that they believe are not being addressed by governments (Jaspal & Nerlich, 2014; Smith & Joffe, 2012). However, this may actually be detrimental for consensus representations (Lynam, 2016; Mayes & Hartup., 2021). Koteyko et al. (2013) identified how representing ACC as a political issue served denialists by de-legitimising hegemonic representations. This was because by framing ACC as a political issue, denialists make climate change an issue that an individual can disagree with based on political leanings, effectively ignoring the normally socially undesirable stance of disagreeing with scientific evidence.

From these results, the benefits of depoliticising or deliberately representing the political-ACC discussion into what governments can do better is evident. Hegemonic

representations during January effectively combatted denialist attempts at representing ACC as an ideological issue by emphasising their own representation that ACC is undoubtedly scientifically valid. When representing ACC as a political issue, hegemonic holders did so by addressing political shortcomings of governments addressing ACC and representing the bushfires as a consequence for this lack of action. In de-politicising or reframing the political representations, hegemonic representational holders were better able to assert their views while curtailing the more effective representational elements of denialists of decoupling ACC from scientific theory and using it as an example of other politically sensitive topics which individuals have the option to disagree with.

Limitations

While this study provided novel results regarding changes of social representations of ACC during the Black Summer Bushfires, it is not without limitations. First, the data used reduces the studies generalisability. Social media is ‘snapshot’ data, and cannot be used to comment on the deeper complexities of social representations of ACC on Australian social media over time (Cody et al., 2015). Twitter also does not represent the complete demographics of Australia, as the site tends to be favoured by younger, left-leaning individuals (Fownes et al., 2018). However, this study’s results can be used as a baseline for understanding general representations of the bushfire-ACC link within both the media and from wider audiences. The data cannot be used as a definitive guide to how all of Australia represented the bushfires, or ACC in general, throughout this period. This limitation could be addressed in future research by gathering from a wider range of social discourse sources available at the time which can supplement the findings from this current study.

A further limitation is the inability to comment on the persistence of the changed representations due to data not being collected after the bushfires. While this study delved deeper into how social representations of ACC are affected during EWEs, it does not have the

ability to comment on whether the changes to some representations, particularly the fracturing of the polemic representation, were lasting effects or if the changes dissipated. Future research into this particular area could utilise this data in addition to collecting data post-fires to explore if the changes to representations found in this study were long lasting as other research suggests (Bednarek et al., 2022; Kassam & Léser, 2021; Linnenleucke & Marrone, 2021).

Implications and Future Directions

Results from this study support previous research relating to the effect EWEs have on social representations of ACC. However, several novel findings and the implications of them open avenues for future research.

The increased salience and cohesiveness of the hegemonic representation due to the bushfires, while not a completely novel finding, still provides interesting implications. Of particular interest is how hegemonic representational holders used the bushfires both for evidence of ACC and for de-politicising it. Previous research has highlighted how explicit framing of EWEs as being caused or worsened by ACC increases belief that it is a serious issue and raises support for mitigation strategies (Broomell et al., 2015). If events such as the bushfires and other atypical EWEs are able to be properly used as evidence for ACC it may aid in increasing acceptance and support for stronger action against ACC. Additionally, the positive effects of de-politicising ACC away from ‘culture war’ issues by consensus holders during January presents avenues for research into how climate change advocacy can be communicated. Future research may focus on how de-politicising arguments for and against ACC, in favour of narratives that emphasise the immediate physical impacts of ACC, effect the success of increasing agreement and support among individuals for action on climate change when it is not continually represented as an ideological issue.

The most novel result from this study was the impact the bushfires had on the polemic representation of ACC. As mentioned, such a finding has rarely appeared in prior literature. The implications of this support other tentative conclusions that EWEs do have a strong destabilising impact on denialist representations of ACC (Fownes et al., 2018). More broadly, this finding may be indicative of a small body of research which suggests the unprecedented nature of these EWEs and their increasing frequency may be causing a shift among denialists, as it becomes increasingly difficult to reconcile their beliefs with constant reminders of the abnormality of these events (Doue et al., 2020). Possible future areas of research may explore if extremely atypical EWEs are having larger negative impacts on polemic representations of ACC. EWEs such as the 2022 English bushfires that burned parts of London could provide a starting point due to the unprecedented nature of this event (ABC News, 2022). More research needs to be conducted within this area to better understand how populations are reacting to these EWEs and how they may be changing peoples' representations of ACC.

Conclusion

The Black Summer Bushfires are one of an ever-growing list of atypical EWEs. The results of this study demonstrate that the bushfires did result in significant changes in both consensus-based and denialist-based representations of ACC. Results suggesting the renewed interest denialist representations had in natural theories of climate change and the bolstering effect consensus-based representations gained from appropriately depoliticising ACC through the bushfires provides direction for future efforts in effective ACC communication policies. By effectively utilising atypical EWEs as evidence for the effects of climate change it may be possible to 'bridge the gap' between denialist and consensus-based representations through demonstrating that, regardless of belief, it is obvious the Earth's climate is changing and bringing with it highly destructive weather events. If this angle of the universally experienced negative effects of EWEs can be used effectively it may be possible to lessen resistance

towards action for ACC. It is likely that atypical EWEs will continue to occur in the future. However, if the findings from this study can be replicated it may serve as the basis from which more effective communication, and eventually effective action, can be taken in order to effectively combat the growing threat of anthropogenic climate change and the extreme weather events it contributes to.

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Appendix

Figure 4.

Detailed Thematic Map of all major Themes and Sub-themes generated from Denialist tweets during August.

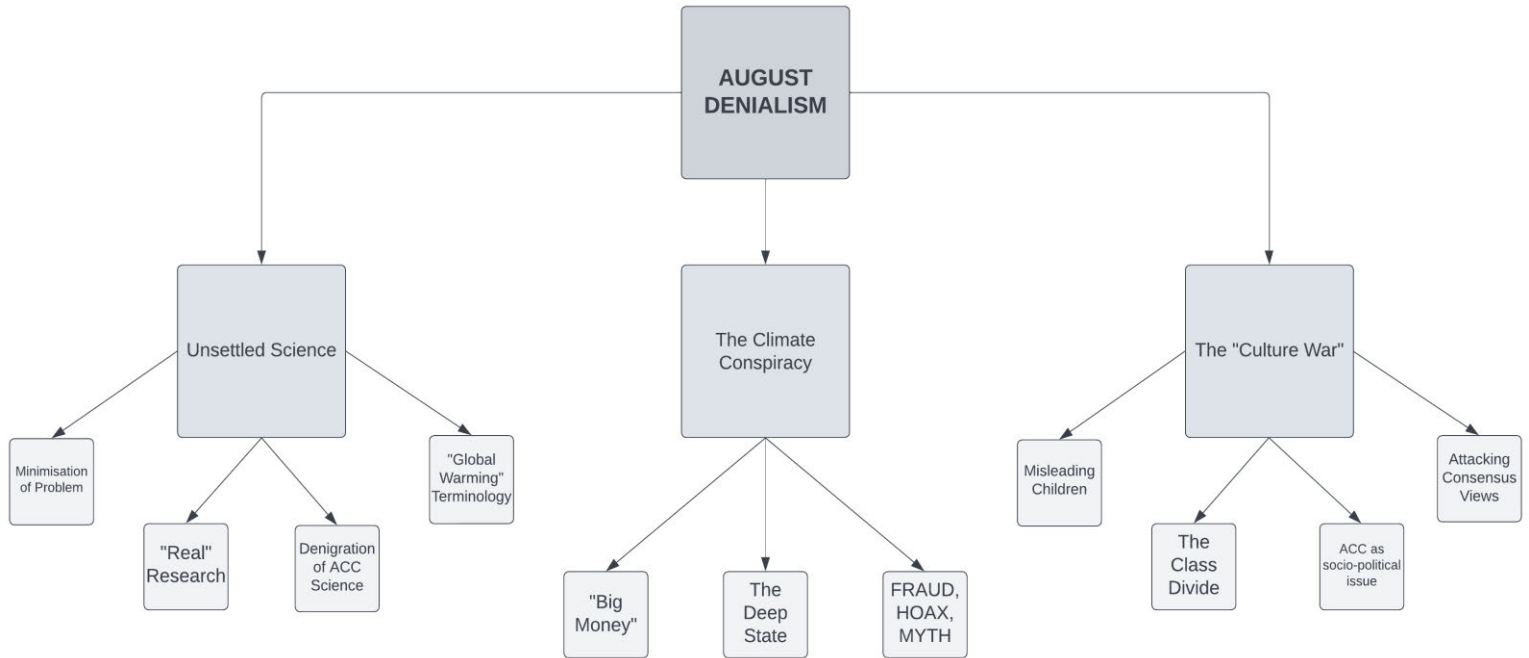


Figure 5.

Detailed Thematic Map of all major themes and sub-themes found in Denialist tweets during January.

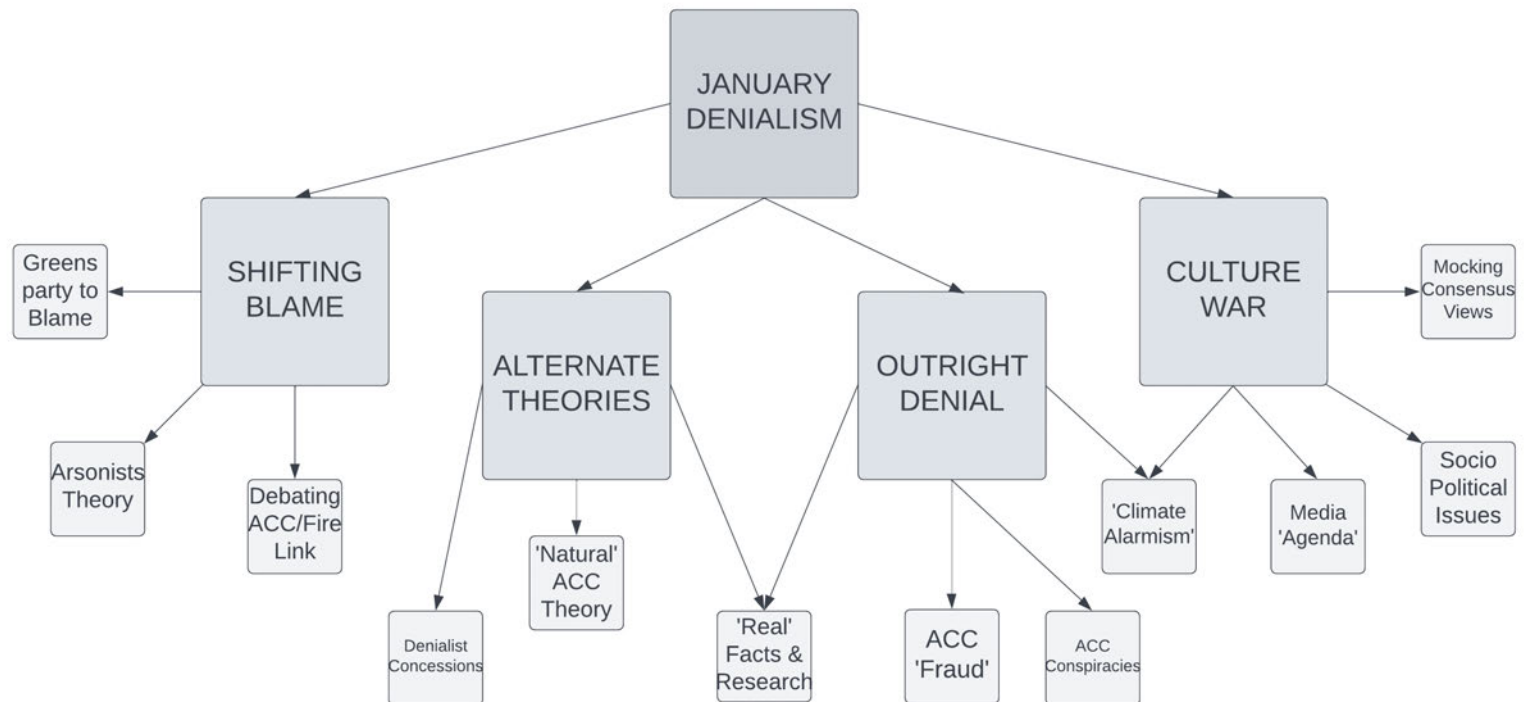


Figure 6.

Detailed Thematic Map of all major themes and sub-themes generated from consensus

Tweets during August.

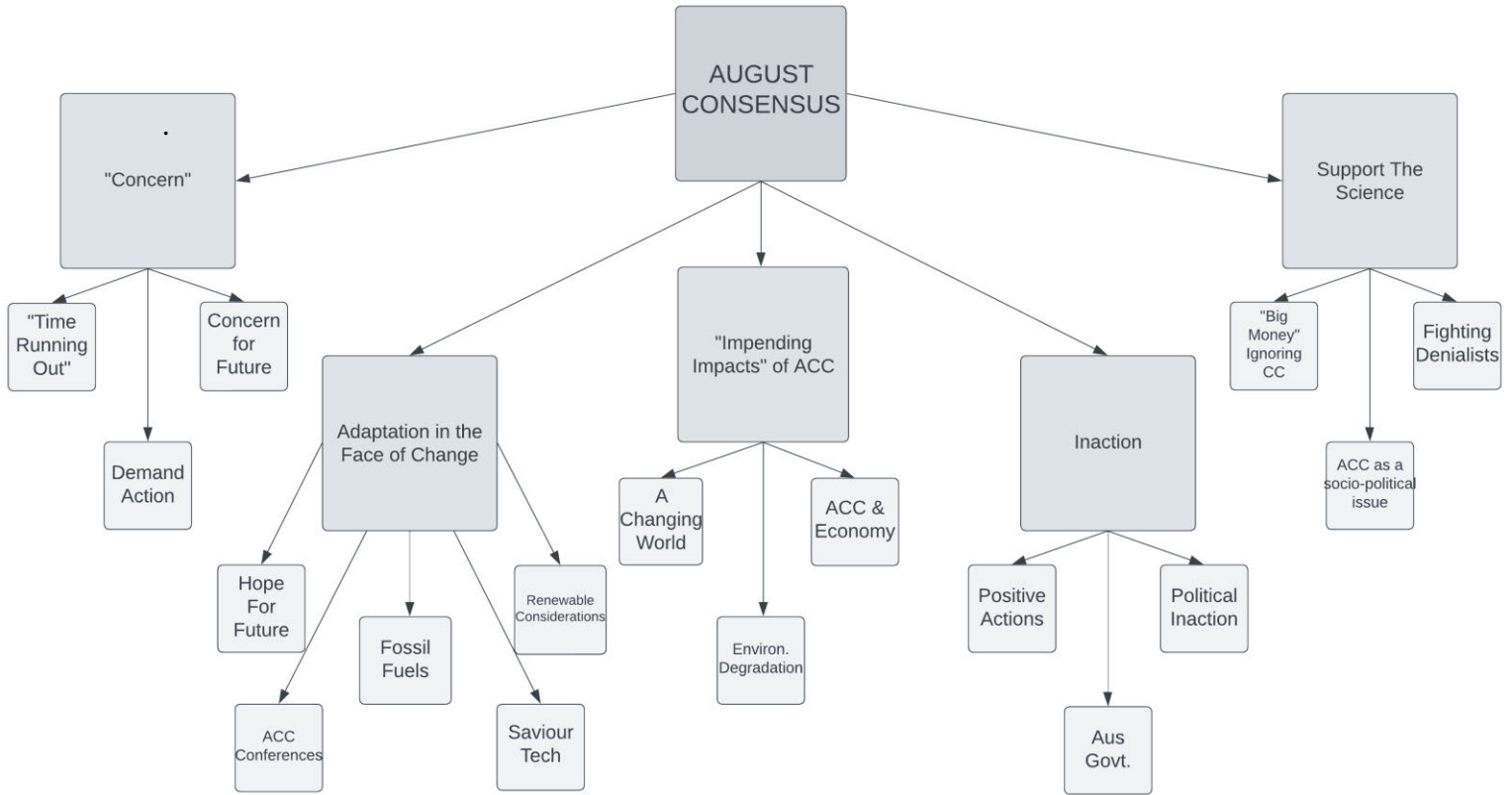


Figure 7.

Detailed Thematic map of all major themes and sub-themes generated from consensus tweets

during January.

