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Media ownership and coverage patterns of established, disruptive, and unconventional climate advocacy groups

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Abstract
Groups advocating on climate and environmental issues often seek to obtain media coverage to increase public awareness of their cause, yet comparatively little is understood about the factors influencing the volume and content of that coverage. This study investigates the quantity and characteristics of media coverage of climate advocacy groups through a mixed-method analysis of 17,380 Australian media articles published between 2017–2022. Four types of advocacy groups were the focus: 'Established' groups (large professionalised environmental groups); 'Disruptive' groups (the greatest use of civil resistance tactics); and two types of what we call 'Unconventional advocates' – those who advocate for action on climate change but from a social identity position that is either typically not associated with climate action ('Role-based unconventional advocates', such as parents or doctors) or has a history of *conflict* with climate or other environmental causes and environmentalists ('Conflict-spanning unconventional advocates', such as farmers and political conservatives). Findings indicate that linguistic cues associated with conflict, achievement, and emotional sentiment differed significantly according to the advocacy group type and media ownership. While Established groups gained the greatest volume of coverage, Disruptive groups attracted the highest conflict language and lowest achievement language, particularly in outlets published by *News Corp* (the Murdoch owned media company). Meanwhile, conflict-spanning unconventional advocates received coverage using language with the lowest levels of conflict and highest levels of achievement. Our findings highlight the potential for new types of climate advocates to gain comparative sympathetic media coverage and potentially expand the social basis of support for climate action.

Keywords Environmental advocacy · Unconventional advocates · Media coverage · Activism

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1 Introduction

Environmental groups that engage in advocacy often seek to gain media coverage to disseminate their message to the widest possible audiences (Rucht 2013). This media coverage is critical as it can raise groups' profiles by publishing information about their issues and activities to mobilise new supporters as well as to influence public opinion and the opinions of decision makers and opponents (Andrews and Caren 2010; Gamson 2004; Rosie and Gorringe 2009). Groups may specifically seek positive coverage that communicates their goals and the progress they are making towards achieving those goals. This type of coverage can be beneficial as it not only raises awareness about their activities but could also demonstrate the group's efficacy, and foster emotional connections to the cause, all of which can motivate more people to join the cause (Van Zomeren 2013).

However, journalistic norms may influence both the volume of media coverage that environmental advocacy groups receive and the sentiment the coverage conveys (Boykoff and Boykoff 2007). Generally, groups that engage in advocacy struggle to gain media attention (Rucht 2013; Williams 2015). When media coverage is obtained, this is often drawn to novelty and conflict, meaning that events that are unusual or involve violence or disruption are more likely to receive coverage (Rucht 2013). Further, while groups may seek to obtain coverage that highlights their achievements in mobilising action on climate change, a range of studies suggest media coverage can instead convey pejorative negative stereotypes and negative emotional representations of activists (Gulliver et al. 2023; Mayes and Hartup 2022).

The present research explores this dynamic by examining differences in media coverage of four types of climate advocacy groups between 2017 and 2022 in Australia. We focus on Australia as a specific case of this coverage in a Western developed country that has laws allowing most types of protest. The first type of group consists of Australia's oldest and best-funded environmental groups (which we refer to as 'established' advocacy groups), while the second type consists of environmental groups that engage in disruptive actions like blockades and sit-ins (referred to as 'disruptive' advocacy groups). The final two categories are what we refer to as 'unconventional'. The first of these are role-based unconventional advocacy groups, i.e., groups that draw on societal roles that are typically not associated with environmentalism or climate (e.g., parents, doctors). The second are conflict-spanning unconventional advocacy groups, i.e., groups that are associated with social identities that have a history of hostility or tension with environmentalists or environmental issues (e.g., farmers, political conservatives).

Our theoretical proposal of these two types of unconventional advocacy groups draws on a well-established body of social psychology research on the role of social identity in communication. This social identity perspective predicts that audiences who do not share the 'environmentalist' identity are less likely to be persuaded by messages coming from an 'environmentalist' identified source (e.g., Fielding et al. 2020; Fielding and Hornsey 2016; Hornsey and Fielding 2017). Based on this social identity perspective, unconventional advocacy groups may act as agents of change, with the potential to engage social groups which exhibit lower levels of support for climate policy or action. These unconventional advocates could play a role as in-group messengers who combine advocacy for climate action with a social identity that departs from the prototypical environmentalist identity, in a way that may resonate more with the climate hesitant or resistant social groups. Given

that these unconventional advocacy groups are relatively new entrants to the climate debate in Australia and worldwide (Diamond 2024), we explore whether they experience media coverage of a different nature to that of the established and disruptive groups who are the typical advocates for climate action.

1.1 Characteristics of media coverage of climate advocacy groups

1.1.1 Conflict

Media outlets may prioritise the coverage of events or issues that include conflict, damage, and spectacle to attract audience attention (Rucht 2013). While social movements seek to engage mass media to share their message amongst new audiences, in general, advocacy groups struggle to gain access to the media. Only a small proportion of advocacy groups and their actions receive coverage in local newspapers, let alone national newspapers, radio, or television (Andrews and Caren 2010; Rucht 2013). Therefore, to gain media coverage advocacy groups may seek to tailor their public-facing activities to include disruption to enhance the likelihood they will be noticed (Rucht 2013). Studies around the world, including Australia, suggest that disruptive protest generates more coverage (Chubb and Bacon 2010; Lester and Hutchins 2012). Disruptive protest can be framed as conflict, with a range of studies suggesting conflict is prioritised by Australian media as highly newsworthy (Cable 2015; Schäfer and Painter 2021; Schulenberg and Chenier 2014).

While disruptive actions may help groups gain access to media coverage, this coverage may come at a cost (Newlands 2018), as advocacy groups also seek positive validation of their efforts (Gamson 2004). The more attention-grabbing the protests are, the more they are likely to be covered by media in a delegitimizing way that can undermine advocates' message and diminish the validity of their concerns (Rosie and Gorringe 2009). Some researchers have argued that stunts produce marginalising frames in media accounts that serve to demonise protesters while enhancing the credibility of their opponents (McFarlane and Hay 2003). Media coverage of disruptive protest, for example, has been shown to frame protestors as dangerous, senseless, or a social problem (Juris 2005; Schulenberg and Chenier 2014). This framing of activists can then influence the extent to which the public perceive movement legitimacy, merit, and utility (Rosie and Gorringe 2009).

1.1.2 Achievement

Media coverage conveying linguistic cues linked to achievement, such as words like "win", "successes", and "achieve", can influence audience perceptions about the subjects of the communication text. For example, Brown and Mourão (2021) demonstrated that media coverage that legitimises protest can increase readers' support for and identification with activists. Linguistic markers such as a confident tone may also increase the likelihood that audiences accept the information being communicated (Pezzuti et al. 2021). Conveying achievement is important to advocacy groups who rely heavily on media coverage to raise awareness about their cause and build political consciousness among the public (Gamson 2004). Perceived effectiveness or efficacy is one of the core drivers of willingness to take collective action (van Zomeren et al. 2004). Demonstrating that groups are capable of achieving change helps recruit new members, generate public awareness of their issue,

and access funding (Brown and Mourão 2021; Thomas and McGarty 2009). Therefore, advocacy groups may seek to not only obtain greater volumes of media coverage, but also coverage which describes and emphasises their achievements.

1.1.3 Emotional sentiment

Favourable media coverage is also desirable since a range of studies have demonstrated the positive association between positive emotions and pro-environmental behaviour intentions (e.g., Feldman and Hart 2016; Nabi et al. 2018). Yet, as noted above, positive coverage is less likely to be received by disruptive advocates, who are often framed more negatively (Newlands 2018). However, to the extent that the conflict-based coverage may potentially highlight a protagonist, other research shows that negative emotional content may also play a role (van Zomeren et al. 2004). For example, some research indicates that readers pay more attention to content with negative emotional content (Bloodhart et al. 2019; Sanford et al. 2023). Analysis of the emotional sentiment of climate change activism related tweets suggests that tweets with negative emotional content were more likely to be shared than those with positive emotional content (Sanford et al. 2023). Similarly, DiRusso and Myrick (2021) found that negatively framed messages regarding plastic pollution led to increased self-reported feelings of anger in readers, which increased intentions to undertake political actions about the issues.

More broadly, there is a consistent link between affective responses and a range of climate change related attitudes and behaviours (Brosch 2021). Affective content can increase readers' support for an issue and enhance their belief that a group's efforts will help effect change (Feldman and Hart 2016, 2018). In turn, both support and efficacy are established psychological drivers of intentions to engage in collective action (Thomas and McGarty 2009; Van Zomeren et al. 2004). Taken together, the research highlights that the positive or negative sentiment that advocates may elicit is consequential.

In this study we investigate whether communication content used by different media publishers varies in conflict, achievement, and emotional language in coverage of four types of environmental advocacy groups. This comparative analysis seeks to uncover patterns and disparities in coverage, offering insights into how various types of climate advocacy groups may be covered favourably or unfavourably in the media.

1.2 Influence of media publisher on climate change coverage

While we have referred throughout the paper thus far to media coverage in general terms, different media publishers attend to different issues and cover them in different ways. Traditional news media consists of online, television, radio and print news sources, which play a critical role in providing information that influences how audiences understand, evaluate, and act on climate change (Schäfer and Painter 2021). Despite media publishers currently experiencing declines in consumption and trust in the post-COVID world, publishers who produce print media remain the most prevalent and trusted source of information in many countries (Newman et al. 2021). Understanding how print media covers environmental advocacy groups and their activities therefore provides a valuable insight into what information is communicated to audiences on environmental collective action.

Two factors have been established as important influences on the characteristics of print media coverage: resources and media ownership. In terms of resources, the Australian media context reflects the global trend of declining revenue, which has led to restructuring and downsizing of publishers and newsrooms (Newman et al. 2021; Schäfer and Painter 2021). Consequently, there is a shortage of journalists available to cover environment- and climate-related issues (Schäfer and Painter 2021). With fewer resources, newsrooms may increasingly rely on public relation sources, particularly advocacy groups that employ communication professionals who are then better placed to control media narratives. From this perspective, the impact of advocacy groups on media coverage may vary as a function of the type of media publisher considered.

Media ownership also has a significant influence over coverage of climate change (Boykoff and Yulsman 2013). In Australia there is a high concentration of media ownership, with 95% of daily news revenue, 75% of free-to-air television revenue, and around 70% of radio revenue controlled by just four top media companies (Brevini and Ward 2021; Stanford 2021). Of this, two publishers are dominant, with News Corp Australia having 65% of media circulation, and Nine Entertainment having 25% of media circulation (Finkelstein and Ricketson 2012). These two privately owned media companies sit alongside the publicly owned Australian Broadcasting Corporation (ABC), which is one of the most widely accessed news brands in Australia (Park et al. 2022), as well as Scott Trust, which publishes The Guardian and Observer news and is generally viewed as left leaning (McAllister et al. 2021).

News Corp owns the country's only national daily newspaper (*The Australian*) and 72% of capital city daily newspapers (Holmes and Star 2018). Majority owned by the Murdoch family, News Corp is described as having a "generally business-oriented and sceptical approach to climate change" (Anderson et al. 2018, p. 931). Bacon and Jegan (2011) in their analysis of 10 Australian newspapers found a negative stance towards climate policy in 73% of all articles, and in particular, 92% of News Corp articles. Similarly, their 2013 analysis of Australian media coverage of climate change found that 59% of articles in the major newspaper *The Australian* did not accept the scientific consensus on anthropogenic climate change, as did 97% of comment pieces in another News Corp outlet, the *Herald Sun* (Bacon and Jegan 2013). Claims of media partisanship regarding News Corp's apparent favouritism of the right/centre-right Liberal-National Coalition parties and hesitance on climate change (Linnenluecke and Marrone 2021; McKnight 2010) are reflected in the political orientation of audiences, with a general tendency of News Corp audiences towards the right of the political spectrum (Park et al. 2022). Conversely, Nine Entertainment has been identified as a comparatively left-leaning media publisher (Holmes et al. 2022; Linnenluecke and Marrone 2021) and alongside Scott Trust and ABC are considered to provide – at least to some extent – a counterweight to the nature of coverage, in general terms, by News Corp outlets (Holmes et al. 2022). Indeed, research on Australian media coverage of renewable energy found that while both News Corp Australia and Nine Entertainment published articles that were supportive and unsupportive of renewable energy policy approaches, Nine Entertainment were more likely to dismiss fossil fuel-based policies and promote renewable energy (Holmes et al. 2022).

To build on the above studies, we examine and compare the volume and characteristics of media coverage on four types of environmental advocacy groups across the four major media publishers in Australia: News Corp, Nine Entertainment, Scott Trust, and the ABC.

1.3 The present study

In the current study we examine the media coverage of different types of environmental advocacy groups and compare how this differs across media publishers. News media influences audiences' perceptions and interpretations of complex issues such as climate change (Linnenluecke and Marrone 2021); it can also play a critical role in agenda setting and conveying legitimacy of coverage (Walgrave and Van Aelst 2016). However, in Australia as elsewhere, media coverage of climate change is shaped by the organisational contexts and structures of newsrooms as well as the political leanings of the media's corporate owners (Holmes et al. 2022; Schäfer and Painter 2021). While we acknowledge the importance of social and broadcast media – a point we return to in the discussion – we chose to analyse media coverage available through Factiva, which includes print newspapers and online news, journals and magazines. This dataset of global news resources was selected given its critical role in enabling advocacy groups to reach a wider audience, generate public interest, set the agenda, and influence public opinion (Boykoff and Boykoff 2004; King et al. 2017). To explore the extent to which different media publishers cover environmental advocacy groups, we explore and compare news coverage across publications owned by the four major media publishers in Australia: News Corp, Nine Entertainment, Scott Trust, and the ABC. This news content from Factiva includes both print and online content from News Corp, Nine Entertainment (including publications previous owned by Fairfax), Scott Trust, and the online news content from the ABC (which does not produce print media).

We first examine the differences in volume of media coverage of the four types of environmental advocacy groups, i.e., 'established', 'disruptive', 'role-based unconventional' and 'conflict-spanning unconventional', using a dataset of 17,380 articles sourced from Factiva. We also compared the amount of coverage of the different advocacy groups across the four media publishers. This aims to address the first research question:

- RQ1: Which type of environmental advocacy group obtains the greatest volume of media coverage and from which media publishers?

We then use Linguistic Inquiry and Word Count (LIWC: Tausczik and Pennebaker 2010) to examine linguistic cues in the dataset related to three focal variables known to influence the effect of advocacy media coverage: conflict, achievement, and emotional sentiment. These linguistic cues refer to the specific syntactic and semantic characteristics of language which can influence the perceptions of receivers as they are used to interpret meanings of text (Tausczik and Pennebaker 2010). LIWC software is able to extract information about specific linguistic features of texts and has been used as a text analysis tool across many domains (Pennebaker et al. 2015). It has been used to identify linguistic cues in language relevant to environmental advocacy groups, including the extent to which environmental advocacy group communication utilises language conveying achievement or success (Gulliver et al. 2021a) as well as detecting emotional sentiment (Merry 2010). We also examine the extent to which these linguistic cues are used differently in media coverage of different types of advocacy groups. This approach allows us to address the second research question:

- RQ2: To what extent do linguistic cues related to conflict, achievement, and emotional

sentiment differ according to the advocacy group type and media publishers?

Lastly, we used Latent Dirichlet Allocation (LDA) topic modelling to explore the linguistic topics conveyed through media coverage, following approaches used in other studies examining environmental advocacy group language and media coverage of environmental issues (e.g., Ejaz et al. 2023; Hase et al. 2021; Ylä-Anttila et al. 2022). This approach has been used to identify patterns of meaning in text in general, such as climate change denialist discourse (Boussalis and Coan 2016) and climate change and energy security topics (Ylä-Anttila et al. 2022). Our aim with this analytical approach is to assess the extent to which media coverage reflects the issues that the advocacy groups are aiming to promote.

- RQ3: To what extent does media coverage of different advocacy groups convey topics that are relevant to the advocacy groups' cause?

2 Method

2.1 Construction of advocacy group subsets

Purposive sampling was used to create four specific types of groups advocating on environment and climate change in Australia, from which media coverage was then gathered. This approach was selected to ensure that a diverse range of advocacy groups was included for a comparative analysis based on the following key attributes identified in the social movement communication literature: resource availability, to determine 'established' advocates; tactical repertoire, to determine 'disruptive' advocates; and identity framing, to determine role-based and conflict-spanning unconventional advocates (e.g., Benford and Snow 2000; Giugni and Grasso 2015; McCarthy and Zald 1977; Porta and Rucht 2002). The groups in each type were determined as described below, with additional information and links to group websites in Table S1 of the supplementary material. The groups selected for each subset are not intended to be exhaustive, but rather serve as representative samples of constituencies that either align with or stand in contrast to the 'environmentalist' identity.

'Established' advocacy groups This subset was constructed using income and staffing data obtained from annual charities reporting data published by the Australian Charities and Non-profit Commission. The 2019 published database was filtered to identify advocacy groups engaging in environmental activities. The top 15 environmental advocacy groups by annual income (ranging from AU$1.2 million to AU$32 million) were listed alongside the top 15 environmental advocacy groups by full time equivalent (FTE) staff numbers (ranging from 40.4 FTE to 670 FTE). Five environmental advocacy groups appearing on both lists were used as representatives of the 'established' advocacy group subset: World Wide Fund for Nature Australia, Greenpeace Australia Pacific, BirdLife, Australian Conservation Foundation, and The Wilderness Society.

'Disruptive' advocacy groups This subset was constructed using tactical data gathered from Facebook event listings ('tactics') organised between 2010 and 2020 by 728 Australian environmental advocacy groups. Each of the 28,000 tactics included in the database was

categorised as either a 'civil resistance' tactic or not (Gulliver et al. 2021b). The environmental advocacy groups with the greatest number of civil resistance tactics over this time period were used as representatives of the 'Disruptive' environmental advocacy group subset: Extinction Rebellion, Australian Youth Climate Coalition, Stop Adani, School Strike for Climate, and Knitting Nannas Against Gas.

'Unconventional' advocacy groups This subset is a theory-driven selection of novel types of advocacy groups active on climate change in the public sphere, which have a group identity that is typically not associated with the 'environmentalist' identity. These role-based and conflict-spanning unconventional groups were identified by the authors through observation of advocacy groups active in the Australian public sphere on climate change and via an examination of a pre-existing comprehensive database of over 3,000 Australian environmental advocacy groups (Gulliver et al. 2020). As a result, four ***role-based unconventional advocates*** ('Role-based UA') are analysed in this study: Australian Parents for Climate Action, Doctors for the Environment, Vets for Climate Action, and Australian Firefighters Climate Alliance. These groups were selected because their group identity is that of a role not stereotypically associated with climate change advocacy, either for or against. In addition, seven ***conflict-spanning unconventional advocates*** ('Conflict-spanning UA') were analysed: Farmers for Climate Action, the Blueprint Institute, Coalition for Conservation, Investor Group on Climate Change, Hunter Jobs Alliance, FrontRunners, and Australian Religious Response to Climate Change. These groups were selected because their group identity is associated with social categories that are stereotyped as being typically expected to oppose climate action: business and extractive industries (Colvin 2020; MacNeil and Beauman 2022; Wheeler et al. 2021; Wilkinson 2020) via Farmers for Climate Action, the Hunter Jobs Alliance, and Investor Group on Climate Change; conservative political alignment (Hornsey et al. 2016) via The Blueprint Institute and Coalition for Conservation; masculinity and its expression in competitive sport (Anderson 2009; Connell 1990; Swim et al. 2020) via FrontRunners; and institutionalised religion (Morrison et al. 2015; Van Rensburg and Head 2017) via Australian Religious Response to Climate Change.

2.2 Media data acquisition

The media data for this study were obtained from Factiva, an international news database that includes over 30,000 media sources, including a comprehensive range of Australian news publishers. A total of 21 searches in Factiva were conducted. Each separate search included the name of one of the environmental advocacy groups in the study population alongside the term "climate" or "global warming" (e.g., "Farmers for Climate Action AND (climate OR global warming)") in Australian media between January 12, 2017, and December 11, 2022; the time period was selected to encompass both pre- and post-pandemic lockdown periods. This is particularly important since much environmental advocacy activity, particularly disruptive protests, occurred primarily outside of lockdown periods. The six-year time period was also chosen to ensure coverage prior to the emergence of Extinction Rebellion in 2018. Any article that mentioned more than one group was included in each group's dataset. This approach ensured comprehensive coverage of each group's media presence, even when they were mentioned alongside others.

To ensure that only relevant articles were included in the analysis, a title review of each article was conducted, and non-relevant hits were removed. All relevant articles were then downloaded, and compiled into a database of article titles, publication dates, media sources, word counts, and authors. A total of 17,380 articles published by 746 media outlets were identified. The publishers of the media outlets were identified through a search conducted online using lists of News Corp, Nine Entertainment, and Australian Community Media outlets, as well as information obtained from the Australian News Index, which was developed by the Public Interest Journalism Initiative (Dickson et al. 2022). The overall volume of coverage for each of the publishers is reported in Table 1.

Given our interest in comparing advocacy coverage across media with perceived different political ideological stances, we selected four of these media publishers for further analysis: Nine Entertainment (left-leaning: Holmes et al. 2022; Linnenluecke and Marrone 2021), News Corp (right-leaning: Holmes et al. 2022; Park et al. 2022), Scott Trust (left-leaning: McAllister et al. 2021), and the ABC (neutral: Park et al. 2022).

2.3 Media coverage linguistic cues and topic modelling

Analysis of linguistic cues found in the media coverage of the four types of environmental advocacy groups was undertaken using Linguistic Inquiry and Word Count (LIWC: Pen-

Table 1 List of publishers, outlets, and number of articles

Publisher	Example media outlets	Number of outlets	Number of articles
Nine Entertainment (including media previously owned by Fairfax)	Australian Financial Review; Busselton Dunsborough Mail; Mudgee Guardian	119	5,450
News Corp	Courier Mail; The Australian; news.com.au	125	5,289
International publishers	Agence France Presse; China Daily	443	2,629
Scott Trust	The Guardian; The Observer	2	1,102
Independent	Coolum & North Shore News; ASX Company Announcements	23	933
Australian Associated Press (AAP)	AAP Newswires; AAP Press Releases	5	743
Press release	Australian Local Government News via PUBT; Private Companies News	8	375
Australian Broadcasting Corporation (ABC)	ABC News (online only)	3	348
Private Media Partners	Crikey	1	306
McPherson Media Group	Benalla Ensign; Shepparton News	10	141
Seven West Media	Kalgoorlie Miner	7	64
		746	17,380

nebaker et al. 2015). The LIWC algorithm enables the detection of linguistic cues and emotional sentiment expressed in text (Chan et al. 2021) and has been used in a number of studies examining environmental related communication (e.g., Gulliver et al. 2021a). LIWC software counts the frequency of words in a document within linguistic and psycholinguistic categories and produces a score for each document of the percentage of words in that category within the text. We examine the frequency of words related to three LIWC categories: conflict, achievement, and sentiment. The conflict category consists of 360 words such as 'fight', 'kill' and 'attack'. The achievement category includes 277 words such as 'better', 'best' and 'working'. The emotional sentiment category summarizes article emotional tone by subtracting negative valence text (example words are 'bad', 'wrong', and 'hate') from positive valence text (e.g., 'good', 'love' and 'happy'), with a score of 50 meaning there is a balance of negative and positive words. A score less than 50 indicates the presence of more negative than positive words (Boyd et al. 2022; Pennebaker et al. 2015). This score provides a useful marker of the sentiment conveyed by articles across the dataset.

We further explored the media coverage using topic modelling analysis via the "Topicmodel" R package (Grün and Hornik 2011). Topic modelling software uses Latent Dirichlet Allocation (LDA) unsupervised machine learning approach, a mathematical process treating each document as a mixture of topics, and each topic as a mixture of words. LDA identifies concepts by reducing complex language through the identification of occurrences of clusters of words. These clusters indicate consistent use of words occurring together and can point to patterns of meaning (Ylä-Anttila et al. 2022). As an inductive unsupervised machine learning methodology, LDA topic modelling is a valuable methodology for identifying patterns of meaning in text. We followed Schweinberger's (2023) guide for pre-processing data. This involved tokenising all articles identified in the Factiva search by removing punctuation and empty lines and stemming word forms into a single word. For example, "politician", "political" and "politics" were converted into "politic" to count them as the same word. Model fitness – k – was determined following Schweinberger (2023), finding an optimum number of 15 topics across the full dataset. Following the identification of each topic and term list, redundant topics (e.g., topics grouping text on publication dates) were removed.

3 Results

3.1 Quantity of media coverage of advocacy groups by different publishers

Research question 1 considers the volume of media coverage obtained by different types of advocacy groups across different media publishers. Table 2 shows that Established advocates received the most coverage overall (n=8,095; 46.6%), followed by Disruptive advocates (n=6,348; 36.5%) and Conflict-spanning UAs (n=2,237; 12.9%), with Role-based UAs receiving the least coverage (n=700; 4.0%). While some Disruptive groups received little media coverage, the subset as a whole was boosted by the substantial coverage of Extinction Rebellion, which was covered in a total of 4,090 articles spanning 4.59 years (M=891.00 articles/year). Role-based UAs received less coverage per year on average (M=116.67 articles/year) than Established (M=1,349.17 articles/year), Disruptive (M=1,058.00 articles/year) or Conflict-spanning UAs (M=372.83 articles/year).

Table 2 Media coverage obtained by each environmental advocacy group

Environmental advocacy group	Advocacy group type	Date of first coverage	Years of coverage	Number of articles	Average articles/year (SD)
Australian Conservation Foundation	Established	12/05/2017	5.58	2,582	430.33 (777.33)
Greenpeace	Established	12/01/2017	5.92	2,318	386.33 (700.94)
World Wide Fund for Nature	Established	12/12/2017	5.00	1,634	272.33 (493.20)
BirdLife	Established	12/06/2017	5.48	874	145.67 (263.49)
The Wilderness Society	Established	12/05/2017	5.58	687	114.50 (207.76)
Mean per category (SD)			5.51	8,095	1,349.17 (2431.94)
Extinction Rebellion	Disruptive	12/05/2018	4.59	4,090	891.00 (1,415.16)
Stop Adani	Disruptive	12/01/2017	5.84	1,169	194.83 (413.20)
School Strike for Climate	Disruptive	12/01/2018	4.83	690	238.00 (238.40)
Australian Youth Climate Coalition	Disruptive	8/01/2018	4.88	271	54.20 (90.66)
Knitting Nannas	Disruptive	12/04/2018	4.55	128	25.60 (39.68)
Mean per category (SD)			4.94	6348	1,058.00 (2149.42)
Doctors for the Environment	Role-based unconventional	27/01/2017	5.86	414	69.00 (124.20)
Australian Parents for Climate Action	Role-based unconventional	12/01/2019	3.92	196	49.00 (63.80)
Veterinarians for the Environment	Role-based unconventional	18/11/2019	3.05	72	18.00 (24.56)
Australian Firefighters Climate Alliance	Role-based unconventional	8/01/2019	1.73	18	9.00 (5.89)
Mean per category (SD)			3.64	700	116.67 (212.15)
Farmers for Climate Action	Conflict-spanning unconventional	22/12/2017	4.97	937	156.17 (282.07)
Investor Group on Climate Change	Conflict-spanning unconventional	12/09/2017	5.25	850	141.67 (259.65)
Blueprint Institute	Conflict-spanning unconventional	10/01/2020	2.86	127	42.33 (39.08)
Coalition for Conservation	Conflict-spanning unconventional	25/02/2019	3.75	124	31.00 (42.33)
Hunter Jobs Alliance	Conflict-spanning unconventional	11/03/2020	2.57	83	27.67 (25.71)
Australian Religious Response to Climate Change	Conflict-spanning unconventional	10/02/2018	4.72	78	15.60 (23.54)
Frontrunners	Conflict-spanning unconventional	17/12/2020	1.90	38	12.67 (12.59)
Mean per category (SD)			3.72	2,237	372.83 (680.13)
Total			4.42	17,380	2,896.67 (5320.36)

A significant difference was found in the coverage of environmental advocacy groups across media publishers (χ^2 (9) = 1,379.3, $p < 0.001$). As Fig. 1 illustrates, the ABC shows a relatively low level of coverage of all advocacy groups. The next lowest level of coverage is by Scott Trust media outlets with their highest level of coverage being for Established

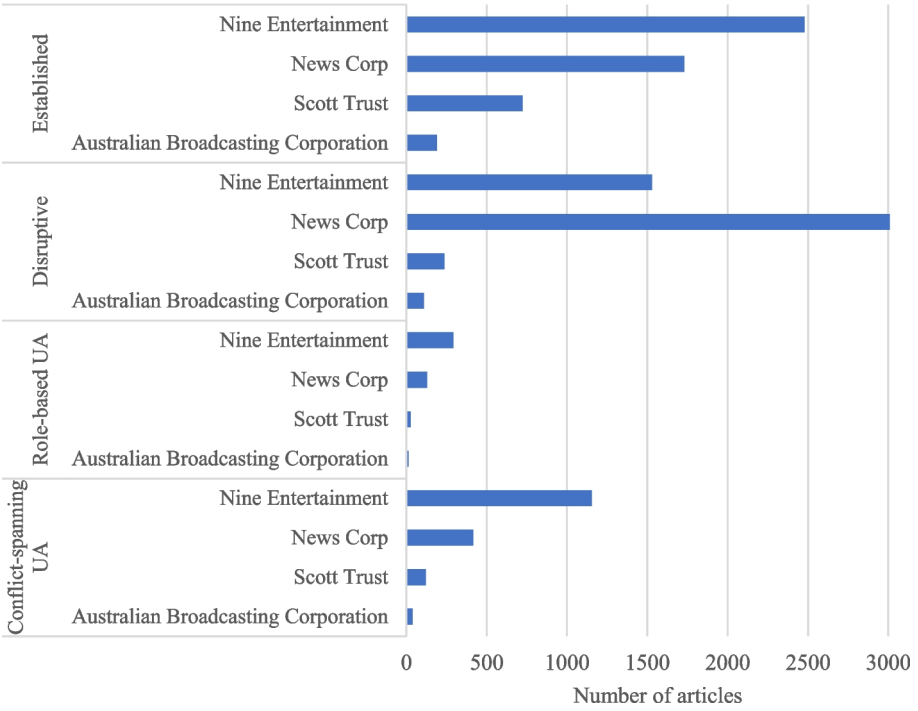

Fig. 1 Volume of media coverage by environmental advocacy group type and publisher

groups. Nine Entertainment show higher levels of coverage than ABC or Scott Trust outlets, with the highest being for Established groups followed by Disruptive groups, Conflict-spanning UAs and Role-based UAs being lowest (although higher than other media outlets for this last type of advocacy group). News Corp have the highest proportion of coverage of Disruptive groups (driven in part by their coverage of Extinction Rebellion in 2019), followed by Established groups, Conflict-spanning UAs and again little coverage of Role-based UAs (see Fig. 2).

3.2 Differences in conflict, achievement, and emotional sentiment according to advocacy group and media publisher types

A series of two-way analysis of variance (ANOVA) tests were conducted to examine the effects of advocacy group type (i.e., Established, Disruptive, Role-based UA and Conflict-spanning UA) and media publisher type (i.e., Nine Entertainment, News Corp, Scott Trust, and the ABC) on LIWC scores of conflict, achievement, and emotional sentiment. As Table 3 indicates, there were significant main effects of advocacy group type (η^2_p=[0.012, 0.058]), media publisher type (η^2_p=[0.002, 0.003]), and the interaction of these two (η^2_p=[0.004, 0.019]) on natural language attributes of conflict, achievement, and emotional sentiment, except for the interaction between advocacy group and media publisher types on the achievement LIWC score which was not significant (η^2_p=0.001, p=0.378). The largest effects were consistently for advocacy group type, which suggested that language used to

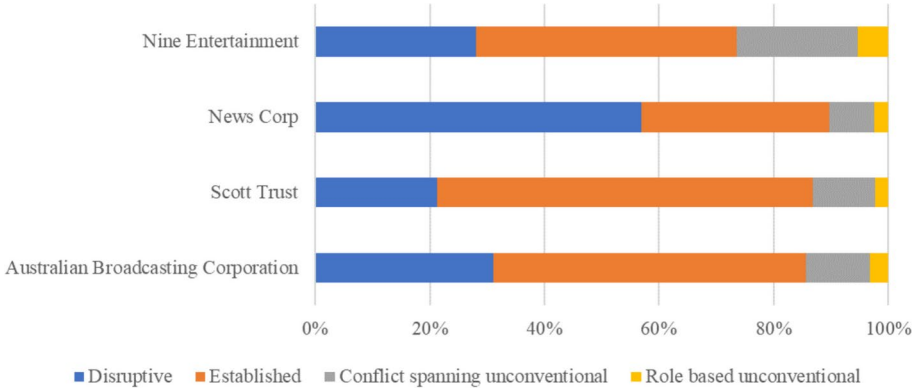

Fig. 2 Proportion of media coverage by advocacy group type and publisher

cover these groups differed substantially depending on the types of environmental advocacy groups. Results also showed that media publishers played a significant role in how these environmental advocacy groups were covered in the media. The descriptive statistics (e.g., means and standard deviations) for conflict, achievement, and emotional sentiment LIWC scores by advocacy group and media publisher types are provided in Table S2 of the supplementary material. Below we discuss these two main effects across linguistic cues followed by the two significant interactions.

3.2.1 The effects of advocacy group type

The main effects of advocacy group on the conflict, achievement, and emotional sentiment LIWC scores were all significant. According to Table 3, for conflict language cues, Disruptive groups received the highest mean followed by Established groups, then the Conflict-spanning and Role-based UA groups (which did not differ significantly from each other). Conflict-spanning UA groups had the highest level of achievement language, while Disruptive groups received the lowest. Similarly, all advocacy groups were significantly different from each other in emotional sentiment language, with the exception of Disruptive and Role-based UA groups. Conflict-spanning UAs received the most positive emotional sentiment while Role-based UAs received the most negative emotional sentiment.

Taken together, media coverage of Disruptive groups was least favourable: they had the highest frequency of linguistic cues related to conflict language, the lowest achievement cues, and the second most negative emotional sentiment. In contrast, Conflict-spanning UAs received the lowest frequency of conflict linguistic cues, the highest achievement cues, and the most positive emotional sentiment. Established and Role-based UA groups were intermediate, with the former more positively evaluated than the latter.

3.2.2 The effect of media publisher type

Media publisher type was also significant on conflict, achievement, and emotional sentiment LIWC scores. Specifically, as shown in Table 3, News Corp coverage was found to use significantly more conflict language compared to Nine Entertainment, while no significant

Table 3 ANOVAs of advocacy group and media publisher on conflict, achievement, and emotional sentiment LIWC scores

ANOVA results	Conflict	Achievement	Emotional sentiment
Advocacy group	F (3, 12163) = 248.30, p < .001, η^2_p = 0.058	F (3, 12163) = 82.14, p < .001, η^2_p = 0.020	F (3, 12163) = 47.63, p < .001, η^2_p = 0.012
Media publisher	F (3, 12163) = 9.19, p < .001, η^2_p = 0.002	F (3, 12163) = 11.07, p < .001, η^2_p = 0.003	F (3, 12163) = 11.70, p < .001, η^2_p = 0.003
Interaction	F (9, 12163) = 25.91, p < .001, η^2_p = 0.019	F (3, 12163) = 1.08, p = .378, η^2_p = 0.001	F (3, 12163) = 5.38, p < .001, η^2_p = 0.004
	Descriptives (means and standard deviations) for advocacy groups		
Established	0.44 (0.02)[a]	1.31 (0.02)[a]	33.10 (0.38)[a]
Disruptive	1.06 (0.02)[b]	1.02 (0.02)[b]	28.41 (0.53)[b]
Role-based UA	0.34 (0.06)[a, c]	1.11 (0.07)[b]	26.20 (1.65)[b]
Conflict-spanning UA	0.25 (0.03)[c]	1.63 (0.04)[c]	39.36 (0.84)[c]
	Descriptives (means and standard deviations) for media publishers		
Nine	0.48 (0.01)[a]	1.33 (0.01)[a]	34.28 (0.32)[a]
News Corp	0.59 (0.02)[b]	1.20 (0.02)[b]	31.47 (0.46)[b]
Scott Trust	0.52 (0.04)[a, b]	1.22 (0.04)[a, b]	30.39 (1.02)[b]
ABC	0.50 (0.06)[a, b]	1.33 (0.07)[a, b]	30.94 (1.58)[a, b]

Higher LIWC scores indicate greater prevalence of relevant terms for conflict and achievement, and a greater tendency toward positive sentiment for emotional sentiment. Within each *column* of descriptives for advocacy groups or media publishers, estimated marginal means (with standard errors in parentheses) not sharing a superscript were statistically different from each other at the 0.05 level. Detailed statistical comparisons are summarised in Tables S3-S5 in the supplementary material

differences were found between other media publishers. News Corp also used significantly less achievement language than Nine Entertainment articles, with the other media publishers not differing significantly from each other. Nine Entertainment conveyed significantly more positive sentiment than News Corp and Scott Trust, which did not differ from each other; the ABC was intermediate and not significantly different from any other media publisher.

Taken together, the data showed that media coverage in the more right-wing (News Corp) articles incorporated the most conflict language, the lowest achievement language, and more negative emotional sentiment. Conversely, the centre-left publisher (Nine Entertainment) coverage utilised the lowest use of conflict language, highest achievement language, and the most positive emotional sentiment. The other two media publishers (i.e., ABC and Scott Trust) showed patterns which were intermediate.

3.2.3 Interactions between advocacy group type and media publisher

As shown in Table 3, there were significant interactions between advocacy group and media publisher on conflict and emotional sentiment. To follow up the significant interactions, simple effects of the advocacy group type were examined for different media publishers in conflict and emotional sentiment (see Table S6 in the supplementary material), with all the simple effects of advocacy group type being significant, $F_s \geq 5.46$, $p_s < 0.001$. As Figures S1-S3 in the supplementary material shows, the difference in amount of conflict language used for disruptive groups compared to other groups is greater among media outlets owned by the

ABC (neutral) and News Corp (right-leaning). Positive sentiment was highest in coverage of Conflict-spanning UAs and second highest for Established groups for all media publishers. The interaction arises because the ABC and Scott Trust outlets convey more positive sentiment toward Disruptive groups than Role-based UAs whereas News Corp and Nine Entertainment do not significantly differ in the positive sentiment associated with those two types of advocacy groups.

3.3 Article topics

Research question 3 examines the topics conveyed by media coverage for each of the four advocacy groups. The prevalence of topics across articles is visualised in Fig. 3, while

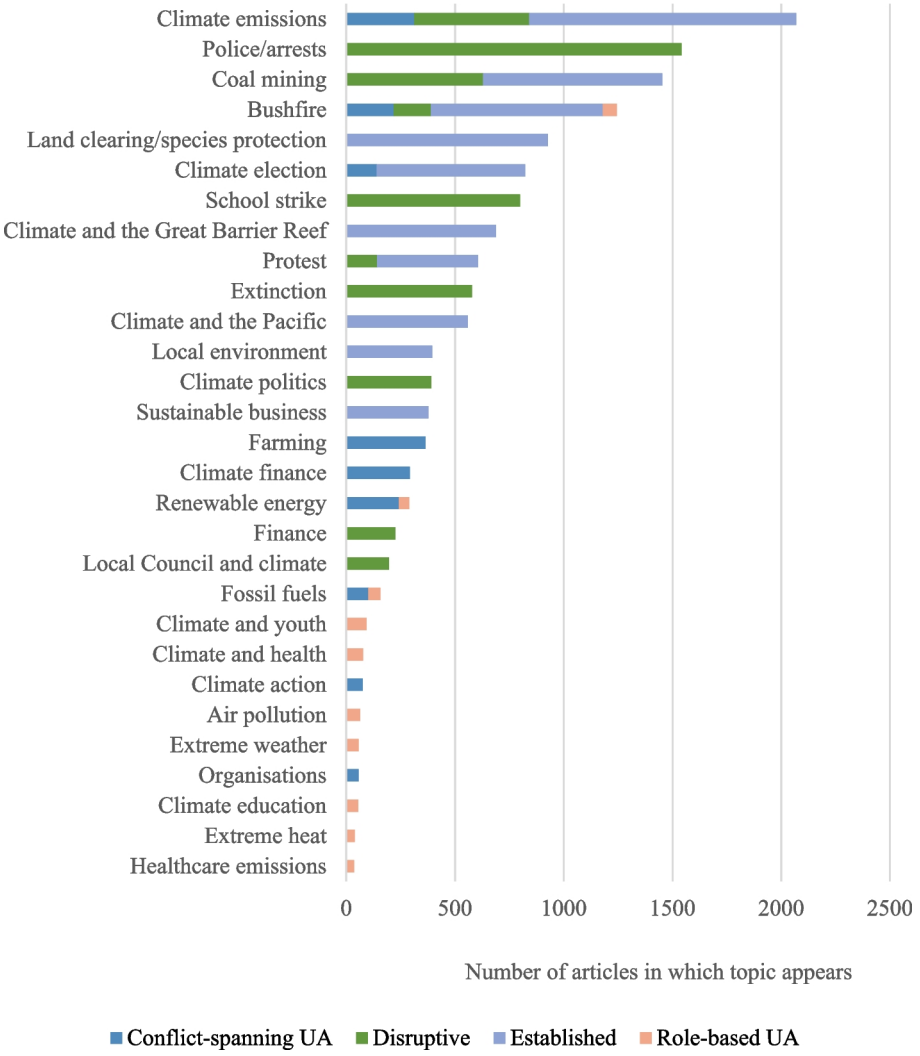

Fig. 3 Topics found in media articles across advocacy group types

Table 4 Most common topics conveyed in media articles

Topic label*	Number of articles in which topic appears
Established advocacy media coverage (n=8,094)	
Climate emissions	1,227 (15.2%)
Land clearing/ conservation	927 (11.5%)
Coal mining	824 (10.2%)
Bushfire	792 (9.8%)
Great Barrier Reef & climate change	689 (8.5%)
Disruptive advocacy media coverage (n=6,348)	
Police/arrests	1,542 (24.3%)
School strike	799 (12.6%)
Coal mining	629 (9.9%)
Extinction	577 (9.1%)
Climate emissions	530 (8.3%)
Conflict-spanning unconventional advocacy media coverage (n=2,237)	
Farming	365 (16.3%)
Climate emissions	312 (13.9%)
Climate finance	292 (13.1%)
Renewable energy	242 (10.8%)
Bushfire	218 (9.7%)
Role-based unconventional advocacy media coverage (n=700)	
Climate and youth	93 (13.3%)
Climate and health	77 (11.0%)
Air pollution	64 (9.1%)
Bushfire	62 (8.9%)
Extreme weather	57 (8.1%)

*Topic labels were assigned by the authors, with articles able to be assigned multiple topics (Benites-Lazaro et al. 2018; Grundmann 2022)

Table 4 presents the topics and terms within those topics found across media articles covering the four advocacy group types. As in Fig. 3, 'Climate emissions' was the most common topic, found in Established, Disruptive and Conflict-spanning UA groups (total n=2,069). 'Police/arrests' was the second most common topic (n=1542). This topic was conveyed only in articles about Disruptive advocates and reflects the consistent link made between disruptive protests and police responses. 'Bushfire' is the only topic found across all four advocacy group types (total n=1,243). This reflects the substantial coverage across all media of the extreme bushfires occurring in December 2019—January 2020. 'Land clearing/species protection' was only found in media coverage of Established advocacy groups.

Table 4 shows that established groups generated a substantial diversity of topics covering both environmental and climate issues with the most common topics across Established articles being climate emissions (1,227 articles, 15.2%), 'land clearing/species protection' (927 articles, 11.5%), 'Coal mining' (824 articles, 10.2%), 'bushfires' (792 articles, 9.8%) and the 'Climate and the Great Barrier Reef' (689 articles, 8.5%) (see Table 4). The topic which occurred most frequently in coverage of disruptive advocates was 'police/arrests', which was found in 1542 articles (24.3%) of all articles focusing on Disruptive advocates.

Conflict-spanning UA media focused predominantly on farming, reflecting the large proportion of media received by Farmers for Climate Action (365 articles, 16.3% of all articles focused on Conflict-spanning UAs). Similarly, the two most prevalent topics, 'climate and youth' (93 articles, 13.3% of all Role-based UA articles) and 'climate and health' (77 articles, 11.0% of all Role-based UA articles) reflected the key concerns of the two groups which appeared in the largest proportion of media on Role-based UA: Australian Parents for Climate Action and Doctors for the Environment. The code and top terms associated with each topic can be found in Table S7 of the supplementary material.

4 Discussion

This study examined the media coverage of four distinct categories of advocacy groups: 'Established' well-resourced environmental advocacy groups, 'Disruptive' groups which engage in the greatest frequency of disruptive protest, and two advocacy categories which we define as unconventional either due to being typically not associated with environmentalism or climate change (referred to as 'role-based' unconventional advocacy groups) or those conveying social identities that have a history of hostility or tension with environmentalists or environmental issues (referred to as 'conflict-spanning' unconventional advocacy groups).

4.1 Level of media coverage

Our first research question investigated which of these four advocacy group types received the greatest volume of coverage across different media publishers. We found that 'Established' environmental advocacy groups, including groups such as World Wide Fund for Nature and Greenpeace, received the highest volume of annual media coverage with 8,095 articles, (47% of the dataset). This was followed by coverage of 'Disruptive' groups (37% of the dataset, 6,348 articles), then 'Conflict-spanning unconventional advocates' (13% of the dataset, 2,237 articles). Role based unconventional advocates received the least coverage with only 700 articles (4% of the dataset). Of the individual groups, Extinction Rebellion, a 'Disruptive' group, received the greatest coverage of all groups, with 4,090 articles totalling 24% of the dataset.

This finding supports research suggesting that groups with access to more financial and staff resources to produce communications content may achieve greater coverage overall (e.g., Williams 2015). Established groups may also receive more coverage because they have historically been in the climate change debate space for a longer time than groups in other categories and have thus been able to establish credibility as climate and environmental communication organisations (Boykoff and Boykoff 2007). Due to this historical longevity and potentially greater source credibility, they may be more likely than other groups to have attracted established journalists to include them in media coverage. The finding also aligns with a growing number of studies indicating that media coverage favours conflict narratives, and that disruptive protest gains more media coverage than non-disruptive protest (e.g., Lester and Hutchins 2012; Rucht 2013), particularly in Australia (Cable 2015; Schäfer and Painter 2021; Schulenberg and Chenier 2014). The extremely high volume of coverage of Extinction Rebellion indicates that utilising disruptive tactics may help overcome

the difficulty most environmental advocacy groups experience in obtaining media coverage (Andrews and Caren 2010; Rucht 2013).

However, this tactical choice may come at a price. Coverage of Disruptive groups used significantly higher proportions of conflict language and significantly lower proportions of achievement language, while also focusing primarily on the topic of police/arrests. Coverage that stigmatises protesters or conveys negative affect may reduce readers' support for and identification with the cause (e.g., see Brown and Mourão 2021; Feldman and Hart 2018; Rosie and Gorringe 2009). Our findings also indicate that Disruptive groups were more likely to receive coverage from News Corp, a right-wing media outlet, which dedicated over half of all media coverage in our dataset to Disruptive groups. Given groups' dependency on media coverage for boosting group resources and sharing information about their cause (Brown and Mourão 2021; Gamson 2004), advocacy groups with fewer resources therefore may face a binary choice: use non-disruptive tactics and gain little to no coverage or use disruptive tactics and gain large but potentially negative and stigmatizing coverage.

Although previous literature (e.g., Hackett and Adams 2018; Mayes and Hartup 2022) has explored the activities and impacts of advocates with identities traditionally opposed to environmental action (e.g., oil worker unions or school strikers), our research builds upon this work by investigating media coverage of unconventional and conventional advocates. Our findings advance understanding of how advocates' social identities impact media content and coverage, demonstrating that the coverage of both types of unconventional advocates is much smaller in volume than that of conventional messengers (i.e., the established and disruptive groups) for action on climate change. However, we have not accounted for the relative efforts made by the different types of groups to *gain* media coverage. So, while we can observe less coverage of the seven conflict-spanning and four role-based unconventional advocate groups compared to the five established and five disruptive groups, we cannot speculate as to whether the unconventional advocates are less inclined to gain widespread media coverage.

4.2 Prevalence of conflict, achievement, and emotional sentiment linguistic cues

Results of the second research question showed significant differences in the prevalence of linguistic cues for conflict, achievement, and emotional sentiment used in coverage of the four advocacy group types across media publishers. Disruptive groups received the highest conflict language, lowest achievement language, and second highest negative emotional sentiment. Our findings provide the novel insight that Conflict-spanning unconventional advocates received the lowest conflict language, highest achievement language, and the most positive emotional sentiment. News Corp coverage used the most conflict language, the lowest achievement language, and a greater proportion of negative sentiment.

These findings support research showing that media ownership influences coverage of climate change (Boykoff and Yulsman 2013). Past research has demonstrated that Australian media views conflict as particularly newsworthy (Cable 2015; Schäfer and Painter 2021; Schulenberg and Chenier 2014). News Corp's reputation for proffering a disproportionately negative stance towards climate change issues in the past appears to be reflected in our findings on the coverage of climate advocacy groups today (Bacon and Jegan 2011, 2013). Given the dominance of News Corp in the Australia media market (Finkelstein and Ricketson 2012), its high focus on Disruptive groups, use of more conflict and low achieve-

ment languages, suggest that Australian media consumers may be receiving a picture of climate advocacy with disproportionate emphasis on civil disruption tactics.

Media coverage can play an important role in setting the agenda for public discussion and influencing public behaviour, as well as signalling how individuals should think about particular issues (Chapman et al. 2023). News Corp's predominantly negative coverage of Disruptive groups may therefore influence perceptions of these groups as more hostile or belligerent, reducing identification and support (e.g., Juris 2005; McFarlane and Hay 2003). Conflictual frames of the messages may also result in underestimation of the degree of consensus and bipartisanship supporting climate action (see also Rosie and Gorringe 2009). Further, coverage of specific events as conflictual may convey that they are more risky or violent, reducing audiences' willingness to join in such actions. This could then flow through to reinforcement of negative stereotypes of environmental activists (Stuart et al. 2018).

Our findings also suggest that by subverting the 'environmentalist' (and perhaps 'activist') identity typically associated with climate advocates, the emergent 'unconventional' climate advocates may receive a more sympathetic coverage in the mainstream media. To the extent that such groups are unconventional in an identity sense, they may escape the media 'tropes' that appear to characterise media coverage of Disruptive groups. However, it is likely to also be necessary for unconventional advocates to remain conventional in another sense, that is conventional in terms of their conduct, i.e. 'playing by the rules' and eschewing actions that could see them conceptually bundled with Disruptive groups and therefore subject to more hostile media coverage that we have observed, particularly from News Corp.

4.3 Topics covered by media publishers on environmental advocacy groups

To address the last research question, we examined the topics conveyed by media publishers in reporting on environmental advocacy groups. Climate emissions was the most common topic across all coverage, as well as in coverage of Established advocacy groups. Conflict-spanning unconventional advocacy groups' media topics were influenced by the high prevalence of coverage of Farmers for Climate Action, with farming the most common topic. A similar pattern was observed in the topics relevant to Role-based unconventional media such as climate and youth and climate and health. The success of these unconventional advocates in conveying diverse climate-related topics with lower conflict and greater achievement language indicates that these groups may have a unique opportunity to build engagement with climate change amongst new audiences. Here we contend that expanding the framing of climate change beyond the usual 'environmental issues' may serve to engage people who feel that climate change is not 'for them' due to seeing environmentalists as a social other (Badullovich 2023). Unconventional climate advocacy groups include a range of messengers who may be perceived as 'in groupers' by a broader cross-section of people. The increased prevalence of identity (and values) aligned messages coming from these groups (Fielding et al. 2020; Hornsey and Fielding 2017) could help to construct a 'new' politics of climate that encompasses an expanded range of people and an expanded range of reasons to care about climate change (e.g., Wright 2009).

4.4 Limitations and future research

While some groups seek to gain coverage, many groups may instead wish to engage in environmental advocacy behind the scenes (Lester and Hutchins 2012). This invisibility may be due to a perception that more could be achieved in the absence of media coverage. Furthermore, media coverage of environmental activities is highly selective, with most advocacy groups and activities receiving no national coverage and little to no local news coverage (Andrews and Caren 2010; Rucht 2013). Taken together, these points indicate that much environmental advocacy may occur outside of media attention. Nevertheless, our findings provide a unique analysis of how environmental advocacy is communicated to the general public. To enhance our findings, future research could incorporate communication produced by the groups themselves to ascertain what types of activities or issues are more likely to transmit into local or national coverage. It could also consider identifying the linguistic cues and topics in self-produced coverage and tracking the extent to which that is conveyed by different media publishers. Further, as our research constructed datasets of relevant coverage for each group (and aggregated into group type), future research may interrogate coverage of multiple types of advocates to see whether media coverage positions them as allies or adversaries. For instance, would coverage of disruptive groups alongside conflict-spanning UA produce a 'radical flank' narrative (Schifeling and Hoffman 2019) with negative coverage of disruptive groups creating a favourable contrast for comparatively moderate groups? Given the constant change and evolution of social movements, future research could also consider exploring if, and when, new unconventional groups arise, and how media coverage of these groups differs or aligns with coverage received by the four advocacy group types examined in this paper. Furthermore, we examined news coverage accessible via Factiva, i.e., text-based news products; broadcast (tv, radio) and social media (user generated content) could be avenues for examining how advocates are portrayed in other media.

Caution in interpreting topic modelling results is also warranted. While we allowed the assignment of multiple topics for each article, there is no established method of validating automated topic modelling outputs and the process proceeds without a theoretical underpinning of what constitutes a topic (Grundmann 2022). We also note that positive sentiment is a broader category of favourable evaluation, while conflict is typically negatively valenced, and achievement is a specific variety of favourable coverage linked to competence or effectiveness. In this sense there is overlap among the three dimensions. Both LIWC and topic modelling cannot identify which component of a particular topic might be positive or negative (e.g., is it the topic of climate change that is portrayed negatively or the activists communicating about climate change). Our comparative approach has, however, allowed an insightful analysis of how topics identified through a common algorithm uncover differences according to advocacy group type and media owner. Future research could seek to supplement this with manual thematic analysis as well as longitudinal analysis for comparative topic analysis over time.

4.5 Conclusions

This study provides a novel analysis of media coverage across four distinct categories of environmental advocacy groups, revealing nuanced patterns in how these groups are por-

trayed in the media. Our findings emphasize the significant role of media ownership in shaping coverage. Differences in coverage associated with media publishers may have a broad impact on public perceptions of environmental advocacy groups, subsequently influencing the public's willingness to support or participate in climate action. We also found that media coverage of environmental advocacy groups with more diverse social identities focuses more on climate-related topics while incorporating greater affective and efficacious language. These groups may therefore play an important role in helping engage new audiences and build broader support for environmental causes. Taken together our study demonstrates the complexity of media coverage of environmental advocacy and the need for continued examination of how these narratives influence public discourse on climate action.

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Declarations

Ethics approval This study did not require ethical approval.

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