

CAMP: Climate Advocates' Media Portrayals

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When we picture a person promoting a political goal—such as lower taxes, marriage equality, or immigration restrictions—we often have a pretty clear idea of that person's group identities. The “typical” climate change advocate, for example, may be a young, highly educated urbanite, most often female and—in the Western world—white. Most likely, media contribute to these images through the people they portray as advocates for (one side of) a political issue. And these portrayals are consequential: people whose identities match those of the typical advocate for a policy stance may be drawn towards that stance, while people with different identities may be pushed away. This project investigates whether patterns in media representation, where members of some groups are much more likely to be featured as advocates for a political goal, cause varying levels of support for that goal among different demographic groups. Using climate as a case, it will answer two research questions: (1) are some groups overrepresented among the people who advocate for climate action in media (WP1)? And (2) does the effect of a message about climate change vary depending on whether the messenger and receiver are part of the same demographic groups (WP2)?

State of the art: in-group persuasion and representation in mass media

We know a lot already about how demographic identities and climate opinions correlate. For instance, climate concern is lower among men, white and older people, and Evangelical Christians (Ballew et al. 2019, McCright and Dunlap 2011, Sherkat and Ellison 2007). What we know less about is where these differences between groups come from. Social groups do not simply adopt stances on issues that match their material interests (Vandeweerd 2022, Cramer 2016). For example, 15 years ago, young Americans were slightly *less* concerned about climate change than older generations—even though they will be much more affected (Feldman et al. 2010). And most people who live in coastal Louisiana seem to be against environmental regulation, despite intense industrial pollution, because they associate green policies with an urban, liberal, big-government elite (Hochschild 2018).

To better understand these patterns, we can borrow a concept from social psychology called the *in-group persuasion* effect. That is, messengers may be more persuasive when they share a social identity with the receiver (Mackie, Worth and Asuncion 1990), for two reasons. First, an in-group messenger is able to communicate that the opinion is a norm inside the group. Norms, in turn, influence group members' opinions (Levitan and Verhulst 2016, Mallinson and Hatemi 2018). Second, if an opinion is held strongly by an in-group member, it is likely compatible with core values shared by most

of the group. So, if visible in-group members consistently signal the same opinion, then listeners from that group might well move towards that opinion. While plausible, the in-group persuasion effect has rarely been tested on political issues, and never in the context of climate attitudes (except for one US study on Democrats and Republicans persuading fellow party members, Fielding 2020).

Mass media are the main way citizens are exposed to persuasive messaging about political issues. The in-group persuasion effect becomes all the more important when it is combined with patterns in the way media represent issues and the people who push for them. For example, media content featuring Greta Thunberg could cause especially young women to become more climate-aware (cf. Wahlström & Uba 2023). On the other hand, the same content might leave older males unmoved, or even push them away from the issue. In other words, the concept of descriptive representation can be extended to issue advocacy in media—and just as people may increase their engagement with politics when they see themselves represented (e.g. Reingold & Harrell 2010), so they may increase their engagement with an issue like climate change when they see themselves represented among its advocates.

In this project, I will develop a novel methodology, showing (1) how media content can link issues to demographic groups, and (2) how we can test the impact of such linking. This method can be applied to any topic that has social identity connotations—e.g. immigration or welfare. It can also be used to answer other research questions. For example, mapping which social groups speak about an issue in the media can speak to the question of who gets to define, frame, and link issues—a key question in the literature on social problems (Hilgartner & Bosk 1988; Jung, King & Soule 2014). More broadly, then, the project is aimed at starting a new line of research into identities, media and issue advocacy.

Methodology

To my knowledge, no studies currently exist that quantify the social backgrounds of messengers who take a particular stance, measured across the media landscape of one or more countries. This is partly because up until recently, it would have been extremely resource-intensive to isolate relevant messages and code messenger demographics at scale. Today, large language models (LLMs) and computer vision allow us to do exactly that. I combine those methods (WP1) with an experimental approach (WP2). While WP1 uncovers demographic patterns among issue advocates in the media, WP2 investigates whether people are more persuaded by messengers whom they share an identity with.

The country cases in this project are Germany (DE), UK and US. All are among the top 40 climate polluters (per person, on the basis of consumption, Eora 2022). The cases also support generalization through their diversity. First, they represent a range of climate concern levels, with 57% (DE), 32% (UK) and 28% (US) of respondents naming climate as a top three challenge for their country (EIB

2023). Second, they span from having rather deep polarization on climate change by political orientation (US) to none at all (DE, Chan & Tam 2023). The stronger polarization, the less likely it is that the in-group persuasion effect will work: we might not be persuaded by someone who shares our demographics if their climate opinions place them on the opposite side of the ideological spectrum from ourselves. Finally, LLMs have strong performance for both German and English, and crowd workers (required for validation steps) are available for both languages.

WP1 (PI, postdoc, student assistant): patterns in the demographics of climate advocates in media

In WP1, I will collect portrayals of climate advocates on news websites and measure their apparent identities. The final result of this project will be an estimate of what percentage of climate advocates in the media appear young, female, in white-collar professions, and so on. We can then compare this with the distribution of demographics in the general population—as well as among citizens concerned about climate change and among climate movement members (e.g. Fisher 2024, p. 71). This will show if skewed representation is due to selection bias by media outlets, or rather due to skewed demographics in the pool of “available advocates”.

With the help of a student assistant, I will download articles (text and images) related to climate change from 6-7 news websites per country, prioritizing sites with broad audiences while also covering both sides of the ideological spectrum (Reuters Institute 2022). Going two years back, this will yield around 100,000 articles in total. The postdoc will be responsible for performing and validating analysis of these. I focus on traditional rather than social media partly due to data availability issues, and partly because traditional media content has larger and broader reach. An extension of this approach to social media channels would have to take into account their more targeted audiences.

The next steps in the project are as follows. (1) for each article, use an LLM to determine the names of anyone advocating for climate action—defined broadly to include, e.g., scientists. The LLM also guesses the apparent gender, age group, education level, occupation, residence and (where possible) ethnicity of each advocate based on the article text. (2) for each advocate, use a model with internet searching capabilities to automatically search for their name and update the demographic guesses. (3) if any of the article’s image captions mention the name(s) of these climate advocate(s), then provide the photo and caption to an LLM with vision capabilities, update demographic guesses again.

Climate advocate names and demographic estimates will be validated against human annotations of a sample of articles. The model outputs should be as close as possible to how humans *perceive* the demographics of the advocate. Preliminary tests using proprietary models such as GPT-4-turbo yielded

high-quality results for these tasks (cf. Hassanpour et al. 2024), but if possible, I will instead rely on locally run, open-source models such as Llama 3 in order to ensure replicability.

A key risk of the project is the bias that is built into large language models and computer vision models. For example, image-based gender classification models are much more likely to misclassify Black women (Buolamwini & Gebru 2018). Some people—for instance, the very young or very old—might not be recognized as climate advocates due to their demographics. This, of course, would warp results. To mitigate this risk, I will build “adversarial” datasets of photos and descriptions that are especially likely to provoke biased responses. I will use the performance of our pipeline on these challenging cases to flag any steps that show bias, and I will bring in additional models (e.g. ones trained on race-balanced data) for those steps.

Main success criterion: reliable ratings of all climate advocates on six demographic attributes, validated against human judgments. **Outputs:** article in Nature Climate Change.

WP2 (PI, postdoc, Parish Bergquist): Effect of climate advocates’ identities

WP2 is a survey experiment looking at how portrayals of climate advocates affect people’s opinions about climate change. The postdoc is responsible for implementation and data analysis. The PI, post-doc, and collaborator Parish Bergquist will be jointly responsible for design choices.

I will use survey company YouGov to recruit DE, UK and US respondents (1000 each) for an online experiment. I will present them with snippets and photographs of people advocating for climate action. Each respondent will have an equal chance of seeing (1) no climate message; (2) a climate message coming from someone with matched demographics; or (3) a climate message coming from someone with all different demographics. These materials will be hand-selected from the ones collected in WP1, covering many different combinations of demographic attributes (gender, age, education, profession, urban/rural, ethnicity). Sampling text treatments from real-world media is increasingly common, because it increases both the external and construct validity of the treatments (Fong & Grimmer 2023). Next, I will use survey questions to measure whether the texts and images changed people’s perceptions of whether people “like them” participate in climate advocacy, their feelings about the climate movement, and their level of concern and policy opinions about climate change. I will raffle \$100 at the end of the study and ask all participants whether, if they win, they would like to donate some of the prize money to a climate movement. Their answer serves as a measure of climate-related behavior (at some personal cost). The key question is whether messages coming from advocates whose apparent identities match the participant’s have larger effects on these outcomes than messages coming from non-matching advocates (using the control group as a baseline).

A risk with this project is that the content and style of the message covaries with its messenger, making it hard to distinguish between the effects of each. I will mitigate this risk by using LLMs to measure key aspects of the message (e.g. complexity, extremeness of position taken) and controlling for them.

Main success criterion: Reliable estimates of the in-group persuasion effect in climate advocacy.

Outputs: article in Political Behavior.

Impact and scientific gain

This project will be the first to test the effect of in-group persuasion via mass media by combining large-n media content studies with survey experiments. Its results will speak to media, policy-makers and NGOs, who may be able to further policy goals by putting forward a more diverse range of advocates—perhaps even tailoring the messenger to the audience. More broadly, this project is part of a new chapter in the study of politics and media, as we discover the potential and limitations of LMMs and computer vision in social science research, balancing performance with replicability and ethics.

Research Team and plan

I am an excellent fit as PI for this project due to my expertise with climate politics, media content scraping and natural language processing of climate debates, and survey experiments for (climate) public opinion formation (Vandeweerd et al. 2016; Hedegaard et al. 2024; Vandeweerd 2022, 2022b, 2023). Parish Bergquist will contribute her expertise on climate attitudes (e.g. Bergquist et al. 2020, Bergquist & Warshaw 2019) and policy-maker and NGO outreach, e.g. via the Climate Advocacy Lab. I will recruit a postdoc with the necessary technical and social science skills, using the channels available to me through my dual employment (in Political Science and Social Data Science) and my own extensive international network (incl. collaborators at MIT, UPenn, UCSB, ETH Zürich).

This project will allow me to strengthen my connections to scholars in the fields of climate public opinion and LLMs, as well as my leadership capacities. By supervising a postdoc, I will hone my skills in communicating and finding a balance between delegating and assuring quality. I aim to create a healthy environment where two-way constructive feedback is combined with a positive atmosphere.

Task	Dates	Task	Dates
S1: lit review + postdoc/SA scouting	Feb – March, 2025	S2: detailed lit review	Dec 2026 – Jan 2027
S1: news scraping	Apr 2025 – June 2026	S2: survey design + pilots	Feb – May 2027
S1: climate advocacy detection	Jul 2025 – Aug 2026	S2: survey fielding	June – July 2027
S1: demographics detection	Sept 2025 – Aug 2026	S2: data analysis	Aug – Sept 2027
S1: validation and data analysis	Aug – Sept 2026	S2: writing + dissemination	Oct – Dec 2027
S1: writing + dissemination	Oct – Nov 2026		