

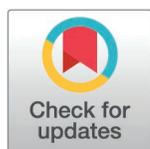
RESEARCH ARTICLE

# Scientists as activists: An ethnography of the ‘critical moments’ in scientists’ transition to climate activism

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## Abstract

This study presents the first ethnographic investigation of scientist climate activism, addressing a major gap in understanding how scientists navigate tensions between professional norms of neutrality, objectivity, and activism over time. Drawing on two years of immersive, longitudinal ethnography with Scientists for Extinction Rebellion in the UK, this study provides a rigorous, process-based account of how scientists enter activism, manage identity conflicts, and negotiate their boundaries of engagement. Findings show that identity-aligned spaces legitimise initial participation and foster belonging. Scientists strategically draw on professional expertise and scientific symbols (e.g., lab-coats, peer-reviewed papers) to legitimise action and engender collective identification. However, these same symbols can also limit participation to those who identify with them and generate expectations of universal expertise. Over time, activism reshapes professional identity, reinforcing moral conviction and producing hybrid scientist-activist identities. Sustained commitment depends on collective efficacy, peer affirmation, and care practices that support autonomy and buffer burnout. Escalation is non-linear: willingness to take risks increases with experience, yet professional, personal, and ethical considerations also influence decisions. By mapping critical moments in scientists’ activist trajectories, this study advances social psychological models of identity conflict by demonstrating how professional norms, moral commitments, and collective actions dynamically interact over time. It introduces the concept of hybrid scientist-activist identity formation as a process, providing original, rigorous, and significant insights that extend theory and inform strategies for effective scientist advocacy.

## OPEN ACCESS

**Citation:** Finnerty S (2026) Scientists as activists: An ethnography of the ‘critical moments’ in scientists’ transition to climate activism. *PLOS Clim* 5(2): e0000828. <https://doi.org/10.1371/journal.pclm.0000828>

**Editor:** Diogo Guedes Vidal, Universidade Aberta Departamento de Ciencias Sociais e de Gestao, PORTUGAL

**Received:** August 26, 2025

**Accepted:** January 20, 2026

**Published:** February 20, 2026

**Peer Review History:** PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: <https://doi.org/10.1371/journal.pclm.0000828>

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## 1. Introduction

Policy responses to the climate and biodiversity crises have lagged far behind the overwhelming scientific consensus [1–7]. Despite a well-established scientific consensus [3–5], policy action remains limited [3,6,7]. This gap between evidence

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**Data availability statement:** The data underlying this study consist of ethnographic fieldnotes and interview materials collected under ethical approval from the Lancaster University Faculty of Science and Technology Research Ethics Committee (approval granted). This approval, together with the conditions under which access to the research setting was granted, explicitly prohibits the public sharing or deposition of raw qualitative data. Participants provided informed consent on the understanding that identifiable materials, including detailed fieldnotes, interview transcripts, and action-planning content, would not be shared beyond the research team. The data relate to participation in high-risk activities, including civil disobedience, and involve small, identifiable networks. As a result, even de-identified data could enable re-identification and pose privacy or legal risks to participants and third parties. These restrictions are imposed by the ethics approval and conditions of access, not by the author. All data necessary to support the study's conclusions are provided within the article in the form of de-identified excerpts and analytic descriptions, alongside [Supporting information](#) where applicable. The underlying raw fieldnotes and interview transcripts cannot be shared. For transparency, a curated list of publicly available materials documenting focal events (including news reports, organisational communications, and documentary footage) is provided in S5 Appendix. Questions regarding analytic procedures may be directed to the corresponding author, but access to raw qualitative data is not permitted.

**Funding:** This work was supported by a PhD Scholarship from the Faculty of Science and Technology, Lancaster University (SF). The funder provided financial support in the form of a doctoral stipend (SF). The funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

**Competing interests:** The authors have declared that no competing interests exist.

and action has prompted a growing number of scientists to step beyond traditional research and education roles, taking part in activism, including civil disobedience. Such actions challenge long-standing norms of neutrality and objectivity, raising questions about how scientists maintain professional credibility while asserting the moral urgency of climate action [8,9]. In this paper, I address three related questions: (1) How do scientists reconcile professional norms with the emotionally charged and value-driven nature of activism? (2) How do they perform and maintain legitimacy in public protest? (3) How do they build and sustain a collective identity as scientist-activists over time?

Scientist-activists represent a unique and understudied group within climate activism. It is argued that, as trusted messengers [10], scientists provide moral and epistemic authority to environmental social movements [11]. However, unlike other activists, scientist-activists bear the burden of maintaining professional credibility, grounded in norms of impartiality and objectivity [12,13], when engaged in protest. Scientist-activists often leverage their scientific credentials, symbolised by the white lab-coat, both to reinforce their credibility and challenge perceptions of activism as unscientific. This shift, from neutral arbiter of knowledge to activist, represents a profound challenge to scientists' professional identities, requiring effort to reconcile these distinct domains [8,9].

This paper presents findings from a two-year ethnographic study of Scientists for Extinction Rebellion (S4XR), a primarily UK-based group of scientists aligned with the Extinction Rebellion movement. As both participant and observer, I attended meetings, marches, and demonstrations, documenting how scientists negotiate their roles as activists. While previous studies have explored scientists' attitudes toward activism and the ideological tensions they navigate [8,9,14] there remains limited longitudinal research on scientist-activism. Grounded in the lived experiences of scientist-activists, this ethnography offers a critical contribution to social psychological theories of collective action by exploring how scientist-activists negotiate and perform their professional and activist identities.

### 1.1 Scientists' responses to climate change

Scientists have a history of engaging directly in social and environmental protest. Notable examples include Carl Sagan's protests against nuclear testing [15,16] and NASA climate scientist James Hansen's multiple arrests [17]. Recent years have seen a marked increase in both the visibility and scale of scientist participation in activism. In the present day, groups like S4XR and Scientist Rebellion (SR) have engaged in high-profile actions, including obstructing fossil fuel infrastructure, leaking IPCC reports, and pasting scientific papers on government buildings [18–21]. These actions challenge conventional expectations of scientific neutrality [8]. While norms of impartiality and objectivity discourage political action [12,13,22,23], many argue that the scale and urgency of the crisis make such detachment untenable [10,11]. These tensions reflect diverse scientist identity constructions [8,9], shaped by differing epistemological commitments and views on public communication of science [24]. Understanding how scientists come to adopt activist identities, feel empowered

as part of activist groups, and act raises critical questions about the psychological and social processes underpinning this transformation.

## 1.2 Becoming a scientist-activist: Identity, empowerment, and change

Protests are dynamic spaces that both reflect society and act as spaces for social change [25,26]. Crowd actions are guided by shared social identities that align personal goals with the group's objectives fostering cohesion, solidarity, collective efficacy, and empowerment [26–29]. Within these spaces, the extent to which scientists identify as activists is a critical factor in determining both the likelihood and sustainability of their engagement [9,14]. This mirrors findings in the wider literature on collective action, where activist identification is strongly linked to participation [30–32].

Collective action emerges through both intergroup and intragroup interactions. Intergroup interactions with governments, media, corporations, or police can catalyse identity re-categorisation, shifting people from personal identities to a shared activist identity in response to perceived injustice [27]. Moments of opposition or repression, such as clashes with police or corporations, can redraw group boundaries and strengthen a unified sense of “we” [27,29,33]. Intragroup ties, by contrast, provide the social glue that sustains activism, offering emotional reinforcement, trust, and intellectual validation [33–35]. Shared, emotionally intense experiences tied to a common identity can further strengthen solidarity and commitment [36].

Emotions are central to mobilisation. Shared intense experiences strengthen solidarity and commitment [36] and emotions linked to collective efficacy and injustice appraisals are associated with intentions to act, including support for non-normative protest when civil disobedience is seen as effective [37–40].

Shared norms also shape tactics and align behaviour with collective goals [26], such as commitment to nonviolent action or collective decision-making. In environmental movements, coalitions of subgroups with distinct norms and values, these norms are continually negotiated. For example, faith-based groups may emphasise moral and spiritual responsibilities, while scientists leverage disciplinary expertise [8,41,42]. Such diversity can enrich collaboration but also generate friction over messaging and tactics. For scientists professional norms of objectivity, neutrality, and rationality may conflict with activist norms of emotional expression, moral urgency, and disruption [8]. Scientists may struggle with the certainty with which non-scientist activists present scientific evidence.

For scientists, the *inflection point*, their initial active involvement, marks a critical juncture in assessing whether their professional identity fits within the collective, a process that can be understood in terms of inter-identity fit between scientist and activist identities [9]. Participation can reshape identities [25] and trigger biographical changes, new relationships, skills, and political identities, that sustain involvement [29,33]. Positive reinforcement, such as peer support or public validation, can foster empowerment, solidarity, and moral conviction, reinforcing their commitment to collective goals [28]. This reflects a bidirectional relationship between activism and moral conviction: engagement strengthens moralised attitudes, which then drive continued participation [43]. Symbolic actions, such as wearing lab-coats during protests, can support this transformation by affirming expertise while signalling ethical commitment. Over time, these dynamics can redefine what it means to be a scientist, enabling individuals to frame activism as an extension of their professional responsibility to act on evidence. This can lead to a hybrid “scientist-activist” identity that integrates disciplinary expertise with the moral and strategic aims of the movement [8,9], and is often accompanied by a scepticism toward techno-solutionism and a preference for systemic change over purely technological fixes [9,42]. Scientists' constructions of the future, whether seen as fixed and inevitable or contingent and transformable, further shape both the urgency and scale of their preferred solutions [42].

However, this research tells us little about how these positions are performed, negotiated, and sustained within collective action over time, or how professional identity is managed in situ. This ethnography addresses this gap by tracing the critical moments through which scientists enter, negotiate, and sustain activism, and develops a three-stage framework to analyse these processes over time. The framework captures both the social psychological mechanisms underpinning these transitions and their practical implications for mobilising scientists in climate action.

## 2. Method

### 2.1 Ethics statement

Ethical approval for this study was granted by the University of Lancaster Faculty of Science and Technology Ethics Board for both fieldwork (approval reference FST-2022–0731-RECR-4) and interviews (approval reference FST-2021–0617-RECR-2). The study involved overt participant-observation with ongoing disclosure of my researcher role. Participants were informed of the researcher's role and the aims of the study, and participation was voluntary. Given the open, fluid, and evolving nature of the group, consent was approached as a collective and ongoing process rather than a single one-time event. Verbal consent was established publicly in group settings and reaffirmed through continued dialogue with members throughout fieldwork. Participants were given repeated opportunities to ask questions, provide feedback, or withdraw.

For the interview component, participants provided signed informed consent prior to participation. Interviews were conducted from June 2022 through December 2022.

### 2.2 Research context

Scientists for Extinction Rebellion (S4XR), founded in 2019, is a UK-based network of roughly 400 natural and social scientists aligned with Extinction Rebellion. Members use disciplinary expertise and professional credibility to foreground the scientific basis for protest, employing symbolic actions such as wearing lab-coats and pasting peer-reviewed articles in public spaces. The group facilitates scientist participation across a range of roles, from science communication to civil disobedience, and provides visible scientific support to XR campaigns [44]. It has produced resources for outreach and education, including *The Emergency on Planet Earth* guide [45]. S4XR have four goals: (1) Facilitating scientist engagement in activism and civil disobedience [46]; (2) Providing visible scientific support for XR through media and public demonstrations [47]; (3) Enhancing XR's scientific communication efforts, bridging the gap between research and activism; and (4) Building connections between XR and scientific institutions.

**2.2.1 Public nature of S4XR and anonymity.** S4XR's actions are public and widely reported, rendering group anonymisation impractical. Individual members are anonymised where appropriate, but the group itself is named to preserve analytic accuracy.

### 2.3 Data collection

Access was obtained through open public online S4XR meetings advertised via the group's website. I joined as a member prior to formal ethical approval in order to familiarise myself with the group, build trust, and openly disclose my research intentions. The aims and nature of the proposed research were first disclosed in an open S4XR meeting in early 2021, where I introduced the project as examining why scientists do and do not engage in activism, and explained my role as a researcher to group members. This period provided multiple opportunities to communicate research aims in group meetings and individually. This time informed my reflexive and auto-ethnographic understanding of the field, but no observational data from this period were treated as formal research data. Formal ethnographic fieldwork began following ethical approval, 28<sup>th</sup> of March 2022–25<sup>th</sup> of April 2023, extending slightly beyond the anticipated end date stated in the original ethics application (31<sup>st</sup> of March 2023). No changes were made to the approved procedures.

Dialogues with participants continued after fieldwork concluded, including opportunities for member checking and review of representations of actions and statements used in this paper. These dialogues informed the survey and interview research, reflecting questions participants raised regarding scientist activism and their own experiences [8,9,42].

**2.3.1 Field sites and key actions observed.** The author was an active S4XR member from 2021 to 2023, participating in meetings, trainings, and protests. Four major actions form the empirical core of this paper, all taking place between the 28<sup>th</sup> of March 2022 to the 25<sup>th</sup> of April 2023 (see [Table 1](#)).

**Table 1. Field sites and key actions observed.**

| Event   | Date   | Type of Action            | Key Features  | Role of Scientists   |
|---|--|---------------------------|---|--|
| Scientist Rebellion Shell HQ Action   | 7 <sup>th</sup> of April 2022<br>(Occurred during the April 2022 Rebellion)  | Non-violent direct action | Fake oil on building; scientific papers pasted to building; arrest of 1 scientist | Symbolic resistance; draw attention to the science (pasting relevant scientific papers)  |
| Scientists for XR Department of Business, Energy, and Industrial Strategy (BEIS) Action | 13 <sup>th</sup> of April 2022<br>(Occurred during the April 2022 Rebellion) | Non-violent direct action | Scientists glued to windows; scientific papers pasted to building; 8 arrests      | Draw attention to government policy and its incompatibility with the science   |
| March for Nature – Part of XR Big One demonstrations                                    | 22 <sup>nd</sup> of April 2023   | Public march              | Non-confrontational, large-scale demonstration and march                          | Scientists placed at front of march with placards on the state of nature in the UK to provide scientific support for the march |
| Ask a Scientist   | 21 <sup>st</sup> – 24 <sup>th</sup> of April 2023                            | Public engagement         | Interactive science booth at Parliament Square during the Big One demonstrations  | Public engagement -inviting passersby to discuss climate and related sciences with researchers; Recruit scientists to movement |

<https://doi.org/10.1371/journal.pclm.0000828.t001>

**2.3.2 Ethnography and participant observation.** Ethnography, a field-based methodology involving observation, participation, and interviewing [48], was employed to explore the social worlds of scientist-activists, capturing how they construct meaning, negotiate identity, and engage in collective action [49]. Participant-observation, involving my observation of, and direct engagement in, S4XR group activities [50], enabled a deeper understanding of how scientists balance activism with professional identity and how activism reshapes their sense of self.

Over a two-year period, I attended planning meetings, public demonstrations, and informal gatherings. Field notes (see [S1 Table](#)) were recorded promptly after each event and supplemented with contemporaneous notes and audio recordings to enhance accuracy. To document identity performance (e.g., the use of lab-coats), I also used photography and video. To contextualise events and triangulate observations, social media posts and news coverage were consulted. Media sources were selected to correspond specifically to the core actions (see [Table 1](#)), including coverage produced within a few months of each event, and were not limited to sympathetic accounts [51]. A full list of media sources is provided in the Supplementary Materials ([S5 Appendix](#)).

**2.3.3 Provenance of participant quotations.** Quotations in this paper are drawn from multiple sources: contemporaneous fieldnotes, video recordings, semi-structured interview, and direct participant communications following key events. Several quotations in the paper were transcribed directly from video footage I captured. Other statements were recorded through brief written notes taken at the time of the event or immediately afterwards, reflecting standard ethnographic practice of documenting salient utterances and interactions as they occur and expanding notes as soon as feasible to preserve accuracy [52]. Some quotations derive from semi-structured interviews conducted with S4XR members as part of a related contemporaneous interview study on scientist activism [8,42]. Additional quotations were obtained via solicited feedback from participants after key events, in which they were encouraged to share reflections on their experiences. The provenance of each quote is included with it: transcribed from video; fieldnote; interview; participant communication.

**2.3.4 Autoethnography.** Autoethnography was incorporated alongside participant observation to capture both the external dynamics of scientist-activism and the internal processes of identity negotiation. As a method that foregrounds subjectivity and reflexivity [53,54], it enabled critical examination of my positionality as both a scientist and activist, and how this shaped my engagement with the field. Autoethnography served two key functions: (1) acknowledging how my position influenced access and interpretation, particularly around legitimacy, objectivity, and professional risk; and (2) providing an additional analytic lens to explore the affective and moral dimensions of identity transformation that may not have been fully articulated by participants. These introspective accounts enriched the analysis by offering insight into the

lived tensions of scientist-activism. Further detail on the structure of the autoethnographic diary and its integration with fieldnotes is provided in the Supplementary Materials (see S2 and [S3 Appendix](#)).

## 2.4 Data analysis: A narrative and abductive approach

This study employed an abductive approach [55], in which analysis emerged iteratively from fieldnotes, participant dialogues, and additional data sources. Themes were refined in dialogue with literature on scientist-activism [8,9,14,42] allowing for interplay between observations and theory. Rather than applying a strictly inductive or deductive framework, this process engaged both emergent patterns in the data and conceptual developments in the literature, leading to the identification of key identity processes, symbolic actions, and mechanisms of sustained activist engagement.

Discussions with S4XR members during fieldwork also informed the development of question prompts later used in related survey and interview research within the project [8,9,42]; in turn, emerging patterns from that work fed back into the abductive analysis here. This iterative exchange sharpened categories around identity performance, credibility management, and role strain.

Reflexive writing was integral to this process. Rather than coding data in isolation, meaning was constructed through narrative, with categories developing in tandem with the writing process. Key moments of activism, such as mass mobilisations, group actions, and interactions with police or the public, were treated as identity-relevant episodes, through which the lived tensions of scientist-activism became visible. This narrative-based approach [56] ensured that analysis remained situated within the temporal and social context of activism, rather than being reduced to decontextualised themes. The final structure of the results, initial engagement, identity negotiation, and sustaining high-cost action, reflects this iterative process of abductive reasoning, reflexive engagement, and theoretical refinement.

## 2.5 The ethics of activist research

Ethical considerations in activist research extend beyond formal procedures to the situational, reflexive decisions required throughout data collection, analysis, and write-up [57]. This requires careful attention to issues of anonymity, researcher positionality, participant representation, and harm mitigation. Given the public nature of many scientist-activist actions, balancing transparency with participant protection presents a unique challenge [58]. A relational ethic of caring and compassion [53,59] was adopted so that published findings “do no harm” to those being studied. Strategies included anonymisation, selective attribution, member checking, and continuous consent [60].

This also involved ‘taking the side’ of scientist-activists [61], reflecting my pre-existing alignment with the movement. While this can deepen insight, it raises concerns about bias, as researchers may be perceived as advocates rather than neutral observers, potentially undermining credibility. At the same time, attempts to adopt a detached stance may restrict access, as researchers risk being seen as untrustworthy or duplicitous, limiting the quality of data collected [61]. Rather than claiming neutrality, I incorporated autoethnography to examine how my positionality shaped both access and interpretation. Acknowledging the risk of over-identification, I mitigated bias through triangulation with external data sources, including media reports, movement documents, and social media records. The extensive public documentation of many activist events, through traditional media, photography, and video, ensured that the analysis did not rely solely on insider perspectives, further strengthening analytic validity [62,63]. A comprehensive account of the ethical strategies adopted in this study, including procedural safeguards, relational ethics, and reflexive documentation, is available in the Supplementary Materials (see [S4 Appendix](#)).

## 3. Results

### **Note on Narrative Perspective**

*This section integrates ethnographic and autoethnographic insights. As a participant and observer, I draw on moments of collective experience (“we”), individual reflection (“I”), and generalised observations grounded in broader group dynamics and collective action theory. This layered narrative approach is intended to balance personal reflexivity with analytic depth.*

### 3.1 Introducing the scientist-activist trajectory

Large-scale XR actions such as the April Rebellion in 2022 [64], and the Big One in 2023 [65,66], serve as identity-centring spaces where participants can consolidate belonging and enact alternatives to the status quo [67,68]. These identity-aligned spaces shape activist identities, reinforcing solidarity, agency, and collective efficacy, empowering participants and sustaining engagement [28,67,69,70]. For scientists, such spaces can function as gateways into activism. As one newcomer explained after joining the Big One “It was important to me to see how many people are passionate about this issue [...] especially other scientists. It made me feel less alone in both my concerns and my actions” (fieldnote).

Scholars have long explored how individuals move from concern to engagement. Klandermans and Oegema [71] proposed a four-step model; sympathy, mobilisation, motivation, and overcoming barriers. Dablander et al. [14] distinguished between barriers that deter willingness and those that deter action. These barriers can be intellectual, questions of legitimacy and identity, or practical, such as fears about career repercussions or not knowing what to do. Scientists’ professional identities introduce unique challenges to activism, requiring careful identity negotiation to maintain credibility while embracing advocacy [8,9].

The findings are structured around a process-oriented framework that emerged organically through the analysis of data, reflecting the temporal progression of how scientists experience and evolve within activism. This three-stage model reflects how scientists transition into activism, negotiate their identities within it, and sustain engagement over time (see Fig 1):

1. Pathways into Activism
2. Managing the Scientist Identity: Negotiation and Performance
3. Sustaining Action: Motivation and High-Cost Actions

Each stage involves distinct psychological and social processes, shaped in part by how the “scientist” identity is symbolically performed and perceived, especially through visible markers such as the lab-coat. The table below summarises these stages alongside identity dynamics and S4XR’s role in enabling participation.

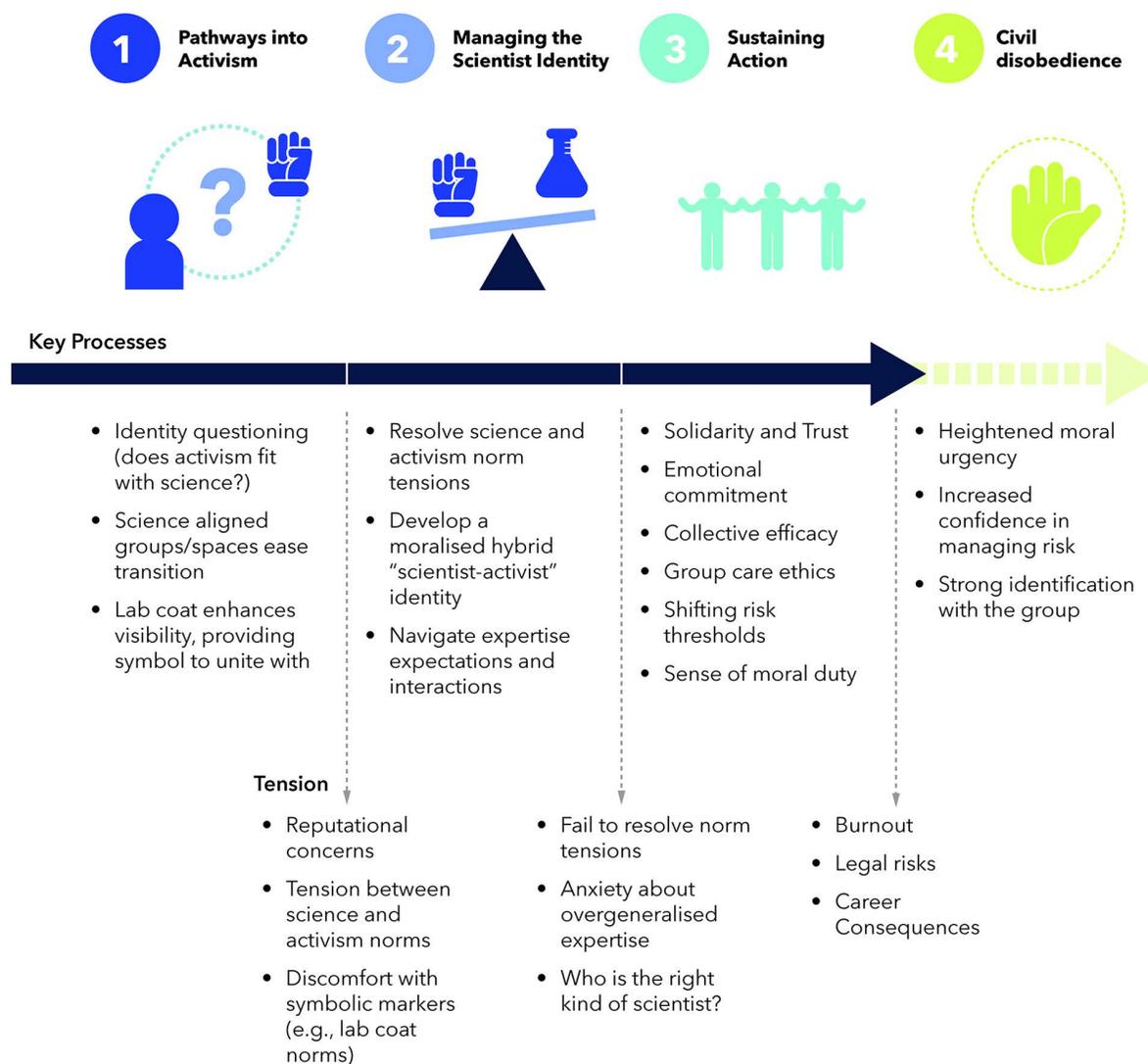
### 3.2 Pathways into activism

For many scientists, the decision to engage in activism is preceded by uncertainty and self-reflection. Questions such as “Is activism right for me?”, “Am I the right kind of scientist?”, “What will others think?”, and “What can I do?” reveal intellectual and practical barriers shaped by professional norms, identity, and risk appraisal. A primary deterrent is fear of professional or legal consequences. Many worry that civil disobedience could trigger institutional backlash, reputational damage, or arrest. Low-risk actions therefore provide accessible entry points for those willing to engage but hesitant to take on high personal risk. The Big One, a large-scale XR demonstration in April 2023, was explicitly non-disruptive and police-sanctioned, offering a safer space for first-time participants, scientists included, who may “worry about the risk of arrest.” One scientist described why they chose it as their first action:

While I have followed XR actions in the past, The Big One offered an easy entry point to joining an action, for me at least [...], as the focus was very clearly on peaceful demonstration rather than civil disobedience, which felt less daunting for a newcomer.

(participant communication)

By lowering perceived risk, events like The Big One helped bridge the gap from sympathiser to actor [71,72]. Scientists who start with lower-risk, socially sanctioned actions may develop feelings of legitimacy, belonging, self-efficacy, and



**Fig 1. Three stage process model of scientists' pathways into activism, identity negotiation, and sustained engagement.** Note. This model is most applicable to scientists who draw on their scientific identity in public-facing activism; engagement in activism itself is optional rather than normative for scientists. However, some of the processes identified here (e.g., identity negotiation, audience expectations, and the role of social support) may extend to scientists engaged in advocacy more broadly. Among those who do engage, the outlined processes may support sustained involvement. For some, these processes may make higher-cost forms of action feel possible. Escalation is not an expected progression for all scientist-activists, rather the model highlights the psychological and relational conditions that make such actions feel possible for some. Figure icons and graphical elements created by Dr. Nuri Kwon (ORCID: <https://orcid.org/0000-0003-0503-1343>) (Table 2).

<https://doi.org/10.1371/journal.pclm.0000828.g001>

empowerment, increasing confidence to take further steps [28,70,73]. However, even in low-risk contexts, many experience deeper discomfort stemming from a cultural mismatch between scientific and activist norms: neutrality versus advocacy, restraint versus urgency. These tensions can inhibit even sympathetic scientists from taking first steps.

**3.2.1 Legitimising participation: Finding roles and reinforcing identity.** Scientists are typically trained to avoid emotive language, resist politicalisation, and maintain objectivity [13]. Activist spaces, by contrast, often emphasise moral clarity, emotion, urgency, and simplified messaging. One participant described how this cultural dissonance can limit engagement:

**Table 2. Stages of scientist–activist transformation and identity negotiation.**

| Stage   | Identity Work   | Lab-Coat Function   | Group's (S4XR) Role  | Key Tensions   | Other Relevant Factors  |
|---|---|---|--|--|---|
| <b>Pathways into Activism</b>                                       | Initial identity questioning and reframing. Scientists begin asking whether activism aligns with professional norms. Entry involves reconciling science with protest and reinterpreting activism as an ethical responsibility. Legitimacy and belonging are nurtured through peer modelling and identity-affirming spaces.            | Functions as a recognisable but contested symbol of scientific authority. Enhances visibility and legitimacy while enabling insider affiliation. However, raises concerns of exclusion, especially among social scientists.                                 | Provides structured, identity-aligned roles that embrace science communication as part of protest and public engagement. Peer-to-peer learning and informal mentorship ease transitions into activism.                                       | Reputational fears, concerns about arrest. Cultural mismatch between activist styles (emotion, certainty) and scientific norms (neutrality, complexity). Unease about lab coat's alignment with 'hard science' reduces engagement for some, especially social, scientists.   | Early actions like <i>Ask a Scientist</i> reduce uncertainty, normalise engagement, and build initial confidence. Peer solidarity, feeling useful, and small wins increase perceived efficacy, reduce perceived risk, and encourage further action.   |
| <b>Managing the Scientist Identity: Negotiation and Performance</b> | Scientists actively negotiate tensions between scientific norms (e.g., objectivity, restraint, neutrality) and activist expectations (e.g., emotion, disruption, moral clarity). Public action, interactions with activists, public, police, and peers shape a politicised, moralised hybrid "scientist–activist" identity over time. | Lab-coat becomes a site of both empowerment and anxiety. Lab-coats symbolise authority shaping interactions with police, media, and public. However, it also generates pressure to meet audience expectations (e.g., universal expertise on 'the science'). | Supports identity performance while ensuring careful framing of actions, message preparation, and member vetting to safeguard credibility. Facilitates internal validation (e.g., affirming membership regardless of career stage or field). | Failure to resolve tensions between science and activism. Conflicting audience expectations, media misrepresentation, and public scepticism ("are you a real scientist?"). Public overgeneralisation of expertise can undermine credibility. Internal doubts about qualifications, especially for early-career or non-natural scientists. Struggles to define who counts as a 'scientist'. | Emotional intensity (anger, grief, moral outrage) reinforces identity transformation. Peer support and emotional validation, shared message design, group rituals build confidence. Role strain and pressure to perform 'ideal' scientist identity may emerge.                                  |
| <b>Sustaining Action (Optional Pathway to High-Cost Action)</b>     | The scientist–activist identity becomes embedded, moralised and affectively charged. Civil disobedience is reframed as a professional and ethical duty. Identity deepens through repeated action, emotional bonds, and shifting risk thresholds. Scientists weigh duty, solidarity, and professional norms in deciding how far to go. | Internalised as part of the activist self. Lab-coat helps justify civil disobedience as principled science communication. However, also raises stakes; public visibility and expectations and emotional weight increase with risk.                          | Supports long-term participation through care ethics, flexible roles, and post-action support. Encourages self-determined contributions while fostering emotional resilience and group solidarity. Engender a sense of collective efficacy.  | Desire to escalate vs. fear of burnout, career consequences, or legal risks. Pressure to act can conflict with personal limits. Norms around risk-taking may develop, but commitment fluctuates, tempered by fatigued and shifting motivations.  | Trust, shared identity, group emotions, and solidarity increase willingness to act. Emotional intensity, hedonic adaptation, and growing self and collective efficacy may lead to higher-risk actions. Over time, emotional shifts and life constraints recalibrate commitment and involvement. |

<https://doi.org/10.1371/journal.pclm.0000828.t002>

Activists frequently come to Scientists asking for the most hard-hitting fact or [...] the best slogan [...] and it's like [...] the things that activists want from scientists, scientists are really reluctant to provide basically, which leads to a lot of frustration. [...] It's like a cultural thing [...] and that has to do with why scientists have difficulty entering into activism to be honest [...] because it's just a different approach, isn't it? It's a different mindset.

(interview)

Concerns about reputational damage, perceived bias, and institutional backlash further compound this discomfort [9,14,24]. Research on scientist-activists highlights the importance of identity reconciliation, a process through which individuals integrate their professional values with activist commitments, rather than seeing the two as incompatible [8,9]. This may involve reframing activism as a moral extension of scientific responsibility; a duty to act on knowledge.

S4XR helps facilitate this transition. Founded to provide scientific support to XR's campaigns, it has evolved into a prominent activist collective offering structured, identity-aligned roles in protest, public engagement, and strategy work while preserving scientific integrity. For many, this sense of purpose and belonging legitimises participation. A founding member described a core aim as providing scientists with a meaningful place in the movement and legitimising XR's actions more broadly. As one participant at The Big One reflected, "It is essential for scientists to be part of events organised by Extinction Rebellion. We validate the demands of XR by participating" (participant communication). Seeing fellow scientists engaged in action, an "approving social milieu" [74], signals to newcomers that activism can be a legitimate extension of scientific identity. One member observed that friends only committed after witnessing this collective presence:

I have a few friends who made the commitment to join after seeing the whole group in action. Even though they knew about XR Scientists through talking to me, they seemed to feel more comfortable seeing a group of scientists working together.

(participant communication)

S4XR's flexible structure supports a range of involvement. Members contribute according to comfort and expertise, through direct action, behind-the-scenes organising, or science communication. Informal peer learning, mentorship, and shared reflection further support those navigating tensions between professional and activist roles.

The 'Ask a Scientist' initiative at The Big One illustrates how identity-aligned formats ease transition. Situated in Parliament Square, it invited passers-by to discuss climate, biodiversity, and related issues with scientists in their areas of expertise. Compared with higher-risk protest, this mirrored familiar public-engagement formats and enabled credible, comfortable participation. This public-facing yet non-confrontational space allowed new members to develop self and collective efficacy [9,35,73], legitimacy, and visibility, while also recruiting new members. A simple but powerful symbol anchored the activity: the lab-coat.

**3.2.2 The lab-coat as a vehicle for social change.** S4XR's public engagement makes strategic use of symbolic markers to signal and unify scientists' participation. As a widely recognised "indicator of a special status" (Joseph & Alex, 1972, p. 723), the lab-coat conveys epistemic authority and professional identity [75,76]. Inspired by the March for Science [77], S4XR adopted the lab-coat to make scientists' presence visible in climate activism and to provide a unifying emblem.

Early public actions in London in October 2019 marked a visible departure from traditional norms of scientific neutrality. Calm, recognisably "scientific" presence was designed to disrupt public and police expectations of what an activist looks like, reframing the scientist identity as a vehicle for social and moral action [26]. By aligning their expertise with activist goals, scientist-activists challenged the idea that neutrality is the only valid stance for scientific professionals, instead asserting a duty to act on the science [8,42].

Yet the symbol is contested. The lab-coat's association with laboratory-based disciplines (e.g., biology, chemistry, medicine) created tension, especially for fields less tied to "hard science." I experienced this during a protest at the Science Museum in August 2021. When offered a lab-coat, I hesitated. As a social scientist, I questioned whether it represented my professional identity. While I recognised its utility, I worried it risked scientism (Scientism is "an exaggerated trust in the efficacy of the methods of natural science applied to all areas of investigation" [78]), an overemphasis on science's authority. When I voiced this, another scientist replied, "Yes, it's scientism, but it's scientism for good," (fieldnote) suggesting rhetorical effectiveness outweighed the risk of narrowing what counts as legitimate knowledge.

For symbolic dress to function in collective identity performance, individuals must experience it as authentic to their self-conception [75]. When a uniform misaligns with identity, it becomes a point of contention [79]. Some S4XR members wore the lab-coat pragmatically, valuing its strategic utility. Others, particularly social scientists, felt it misrepresented their discipline or imposed an unwanted hierarchy within science. Psychologists, for instance, noted the coat's links to

laboratory research and associations with studies like Milgram's, complicating its meaning. More broadly, the natural-science association raised concerns about epistemic exclusion.

Several sociologists and anthropologists expressed that the lab-coat discouraged them from joining S4XR. In response, a group of social scientists and I convened a public symposium on social science and the climate crisis. Despite connecting over a hundred colleagues, no unifying visual symbol emerged. A tongue-in-cheek proposal for tweed jackets underscored the symbolic asymmetry across disciplines. The absence of a shared signifier highlighted the importance of dress for collective organising [75,76,79]. For some, this symbolic gap made the 'scientist-activist' identity harder to claim and perform.

Despite these tensions, the lab-coat remained powerful for those who chose to wear it. Over time, I came to embrace it. Being part of a collective of scientist-activists helped me feel my academic background had a place in climate activism. The lab-coat, once alienating, came to symbolise belonging and enabled me to act with greater clarity and confidence. During the Science Museum protest, I observed how it shaped interactions with the public, establishing trust and prompting engagement.

While early involvement with S4XR helped many scientists find meaningful roles, it also surfaced deeper questions about identity fit. For some, the tensions proved insurmountable, leading to disengagement. Others remained involved but distanced themselves from the scientist identity in public-facing roles. These differing responses reflect the ongoing challenge of reconciling professional values with activism. The next section explores how scientists manage these tensions over time, and how their identities are performed and evolve in response.

### 3.3 Managing the scientist identity: Negotiation and performance

Scientists who enter activist spaces navigate tensions between professional norms of objectivity and neutrality and the emotional, disruptive, morally charged nature of activism. These negotiations occur internally, as participants reconcile their roles as scientists and activists, and externally, as they engage with the public, media, and other activists. Over time, the scientist identity may evolve, becoming moralised and hybrid, blending scientific expertise with activist urgency.

**3.3.1 Privilege & boundary-breaking.** Scientists entering early XR demonstrations discovered that their professional status could confer a measure of "unarrestability" with the lab-coat imparting a 'bullet-proofness'. As one participant recalled of October 2019 "That was the first time I ever wore a lab-coat [...] We did like two days of actions, including some roadblocks. We [...] tried to get arrested basically and the police carried us out of the road, but they didn't [...] arrest us" (interview). This perceived immunity disrupted typical policing assumptions, which often treat any crowd as inherently threatening [80]. By performing a scientific identity, displaying peer-reviewed papers or wearing lab-coats, scientist-activists grounded civil disobedience in expertise, countering stereotypes of activists as uninformed. "A group of scientists in their lab-coats makes a great impression on people," noted another member after the Big One, "they can't say we [...] don't know what we are talking about [...]. So, I feel it's important to show up and make our presence known" (participant communication). Yet, this privilege proved conditional. Police responses shifted over time; the first mass arrest of scientists at COP26 in November 2021 underscored that scientific status offered limited protection [81].

Differential treatment extended to media coverage. At the BEIS action in April 2022, scientist-led protests attracted disproportionately higher press and social-media attention, outpacing larger, simultaneous non-scientist XR blockades at Shell headquarters. This attention extended beyond the event, with BEIS subsequently featured in documentaries, talks, and news articles [82–85]. Capstick et al. argue that scientists' trusted authority amplifies public impact [11], aligning with research on identity performance as an audience-influencing tool [86]. This difference in treatment creates expectations about what scientists can and should do in action, shaped both by scientists' self-conceptions and by audience assumptions.

**3.3.2 Curating the scientist persona.** Unlike conventional activists, scientists carry the weight of trusted expertise [87], which places unique constraints on how they perform protest. The April 2022 BEIS action exemplified how scientists

curate public image, balancing the precision and restraint of scientific communication with the boldness needed to attract attention. During planning, members debated how to distil complex climate science into a message that was both accurate and impactful, landing on the stark but evidence-grounded slogan “New Oil and Gas = Death”. They also considered how to ensure originality sufficient for media attention while aligning with the perceived dignity of the scientist identity. Options ranged from conventional placards to more provocative tactics (e.g., paint-filled balloons used by Scientist Rebellion) to pasting scientific papers onto government buildings. As one participant remarked:

Scientists are people who normally don't participate in these protests, who, dare I say, seem dignified. I thought it was fantastic, the paint throwing, which was great, but it might not fit with the image of a scientist, if you see what I mean?

(fieldnote)

Ultimately, the group chose a strategy that balanced confrontation with credibility. Scientists in lab-coats bearing the chosen slogan pasted peer-reviewed articles onto the BEIS building, held matching placards, and engaged in symbolic civil resistance, including gluing hands to the glass and chalk-spraying windows [18]. The event highlighted the ongoing negotiation of what constitutes “appropriate” behaviour for scientists in activist spaces.

A similar negotiation emerged during the March for Nature at the Big One, where we were positioned at the front of an estimated 60,000-person march, carrying placards with stark biodiversity statistics and acting as ambassadors for scientific evidence. Visibility heightened expectations. In the rush to assemble, I carried a placard citing a Woodland Trust statistic about the loss of old-growth forests. When approached by a live-streamer, I was expected to speak authoritatively on ancient woodland conservation. I explained that colleagues had prepared the figure and pointed to its broader relevance, but I was acutely aware of my lack of expertise on the topic. The lab-coat symbolises expertise, yet it may generate audience expectations that any scientist-activist can speak for the entirety of environmental and climate science, which could constitute straying beyond one's proximate expertise [88]. We mitigated this risk by building and signalling shared expertise. The placards were collaboratively compiled and checked; on the ground, we named our own specialisms and sought expert opinion from the group where a question fell outside our expertise. Science does not have fixed borders; its boundaries are drawn and redrawn depending on context [89]. In practice, the authority claimed was not personal omniscience but embeddedness in an epistemic community, with legitimacy resting less on the lone expert than on ties to collective processes of review, collaboration, and accountability [90]. These moments set up a recurrent question in my fieldwork: who counts as a “real” scientist?

**3.3.3 Who counts as a scientist? Gatekeeping identity.** While the lab-coat anchors the scientist identity in protest, its authority is not always accepted at face value. Throughout the Big One, the question “Are you a real scientist?” surfaced repeatedly from members of the public, journalists, and fellow activists. When some learned that participants were not climatologists, they questioned legitimacy; others queried formal qualifications. In one exchange, a member of the public appeared reassured when I described myself as a social science doctoral candidate with a bachelor's and two master's degrees, standing alongside a cancer biologist with a PhD. The issue was not simply field, but validation of status. These tensions surfaced in media representations. The Daily Mail published a photo of our group during the march, but described us only as “activists in lab coats,” omitting reference to scientific credentials [51]. Similar coverage often erased or downplayed professional affiliations.

Public encounters made visible the blurred boundaries of scientific identity. At one point, an older protester pointed at my lab-coat, questioning whether behavioural science and social psychology were “real science” compared with the microbiologist beside me. This illustrates the difficulty some social scientists face in claiming a “scientist” identity in activist settings.

External challenges were mirrored by internal doubts. Retired scientists and a physics PhD student expressed hesitations about whether they “counted” as scientists for S4XR. The retired scientists wondered whether lack of current

employment undermined legitimacy; the student was unsure if a doctorate was required. Such concerns were often resolved through peer affirmation, highlighting the role of in-group validation in reinforcing identity [91]. A retired XR scientist reassured a retired agricultural scientist that their training still shaped their worldview, affirming that scientific identity extends beyond employment. S4XR reinforced inclusivity by showcasing disciplinary breadth, from physics to cancer biology to environmental psychology, as evidence that climate advocacy is a responsibility shared across the sciences. These practices affirmed that being a scientist is not reducible to one field or status, but grounded in shared values, methods, and ethical commitments.

To preserve a clearly defined contribution, S4XR restricts membership to individuals with a master's degree or higher in a natural or social science. During the Big One, several non-scientists expressed interest in joining; requests were politely declined. This boundary-setting helps maintain the network's epistemic authority and distinct role within the broader movement, while collaboration with non-scientist allies remains routine.

Nevertheless, a broader paradox remains. Fully qualified scientists may question their own legitimacy due to career stage or disciplinary background, while external audiences challenge their authority regardless. Public performance often demands universal expertise even when individuals are transparent about limits. This raises a practical question for activist settings: how can scientists claim authority without overreach, balancing the responsibility to speak out with remaining within proximate expertise [88].

**3.3.4 From scientist to scientist-activist.** Social identities change through performance [25,26,86]. Public action challenges scientists to reconcile scientific norms with the demands of advocacy [8], prompting transformations in how they understand their role in society. Over time, these negotiations can produce a hybrid *scientist-activist* identity. The lab-coat, as a multilayered symbol, helps negotiate these multi-layered identities [92]. At BEIS, one scientist, glued to a window beside a pasted peer-reviewed paper, described overlapping duties towards science, self, and future generations:

I'm feeling proud, feeling like I've fulfilled a duty, a duty to myself, but also a duty to the science [they gestured to a paper pasted to the window beside them], and a duty to all my loved ones, my nephews, and my nieces. [...] As a scientist I believe we have a duty not only to uphold the integrity of our work but to protect the public, to protect the natural world that we study. It is no longer enough for scientists just to do publications. We also have to do public action. That's why we are here today. That is why we are taking part in this civil disobedience.

Scientist arrested during BEIS, 2022 (transcribed from video)

Here, civil disobedience is justified not as a departure from professionalism but as a fulfilment of it. The tools of scientific communication, papers, lab-coats, statistics, are redeployed to express ethical commitment.

A further example occurred during a die-in near The Mall at the March for Nature. Around us, participants lay in silence to symbolise the victims of environmental collapse. We, the scientists, remained standing, placards raised as a call to "listen to the science". A colleague's visible ecological grief [93] disrupted the expectation of scientific detachment, highlighting that scientists, too, feel the profound weight of the climate crisis [94]. Standing amidst the silent crowd, our presence was both a testament to the severity of the crisis and a challenge to the idea that science can, or should, remain emotionally detached from its consequences.

Emotion is central to this transformation. As participation continues, anger, frustration, and moral outrage at political inaction shape self-understanding and commitment. "I'm angry, I'm really angry that we have to do all this, that we have to get to this point, that I have to [...] push for change in this way. It's not fair. It's not right," reflected a scientist later arrested at BEIS (transcribed from video). Moral conviction tends to grow through repeated action [43]; anger and moral outrage are associated with increased willingness to act [37]. The scientist identity becomes politicised and affectively charged, extending obligations beyond academic norms and, for some, increasing willingness to undertake higher-risk actions.

Yet escalation is not inevitable. Scientists weigh risks within social contexts shaped by solidarity, perceptions of efficacy, and shared moral emotions. The next section examines how trust, care practices, and emotional reinforcement sustain engagement over time and shape risk thresholds.

### 3.4 Sustaining action: Motivation and high-cost actions

We sheltered discreetly in an alley around the corner from the government department of Business, Energy, and Industrial Strategy, my heart pounding. Lab-coats with the freshly printed “New Oil and Gas = Death” message were hidden beneath long coats. Moving in small groups to avoid rousing attention, we positioned ourselves across from the building. Suddenly, a loud cry and flare smoke signalled XR activists’ distraction at the BEIS entrance. S4XR members seized the moment. No time to think, I darted across the road, weaving through traffic to film the action. Scientists pasted peer-reviewed papers to the windows; others glued their hands beside them. A vanguard held placards aloft. Within two hours nine scientists were arrested.

This episode opens a window on how commitment is sustained and higher-cost action becomes possible. Most do not begin with a readiness to risk arrest. Participation builds through a gradual layering of moral commitment, group bonding, and a sense of efficacy.

**3.4.1 Frustration, efficacy, and the turn to civil disobedience.** A common catalyst is frustration with the perceived limits of conventional science communication. Years of publishing, advising, and outreach can feel insufficient when policy remains unchanged. As one scientist glued to the BEIS window put it:

No regrets. This has to be done. We’ve tried everything else. We are trying everything else still [...], doing research, writing papers, trying to engage with policymakers, communicating to the public, with the media etc., etc., etc [...] but it’s not enough [...] so this is the last resort me and twenty or so scientists feel we need to take.

Scientist arrested during BEIS, 2022 (transcribed from video)

This speaks to two drivers of escalation: perceived ineffectiveness of “normal” channels and a deepening sense of duty. What sustains escalation, however, is collective efficacy, the belief that acting together can produce change, combined with evolving community norms that recast participation as a professional obligation to act, not only inform [8,9]. A second scientist appealed directly to peers:

As scientists, we have tried to warn the world as reasonably and as rationally as possible, [...] But what is the point of doing it if it just gets ignored? [...] We really urge you, all of you, to join us.

Scientist arrested during BEIS, 2022 (transcribed from video)

Here, civil disobedience is framed as moral witnessing and a peer-to-peer invitation to join. Yet endurance in high-cost action depends on the social infrastructure around it, solidarity, trust, care practices, and shared identity, which lowers perceived risk and embeds individual resolve in a collective.

**3.4.2 Solidarity, trust, and decision-making in scientists for XR.** In the days leading up to the BEIS action, extensive discussions took place about roles, risks, and personal thresholds. The decision to participate was not taken lightly. Participation was self-determined and skills-matched, from gluing on, to holding placards, to filming, so involvement felt empowering rather than pressurised, consistent with evidence that group support can foster efficacy and psychological empowerment [28]. During action planning, one member voiced career-risk worries; another replied, “You are among friends” (fieldnote). The norm was explicit: participation was voluntary, contribution at any level was valued, and no one was pushed to escalate beyond personal limits. For myself this constituted filming the BEIS action.

Care practices ran through the action itself. A scientist glued to the window emphasised “Above everything else, I want to make sure everyone is OK, that everyone feels safe and valued and has a voice” (transcribed from video). This

care-oriented approach operated as a safeguard against burnout, common in activist settings, by distributing responsibility and legitimising non-arrest roles alongside arrest-risk roles [95]. Scientists frequently reminded one another that participation at any level was valued, reinforcing a sense of solidarity and empowerment [70]. One scientist, reflecting a week after their arrest at BEIS, summed this up, “It’s all community-based, right? I can take a lot more on and I can take a lot more personal cost if I’m with others who will support me” (interview).

This mutual support deepened over time. I felt it too, being welcomed, trusted, and supported strengthened my resolve. Another arrestee described the payoff succinctly:

Activism can be very emotionally draining [...] but it gives me a sense of community. It can be a really energising environment. [...] We end up forming new connections [...] I’m so grateful [...] It really helps you develop and grow and work with people who then work together and act in a much more effective way.

Scientist arrested during BEIS, 2022 (transcribed from video)

Alongside emotional care, solidarity was practical. XR wellbeing teams provided logistical and on-site support; XR Doctors, in scrubs, engaged passers-by and helped de-escalate tense moments. In the days after the action, scientists joined others outside Charing Cross Station to protest a colleague’s treatment in custody [96,97]. Protesters highlighted the inhumane treatment of climate activists within the legal system, framing this case as a broader attack on scientific dissent.

**3.4.3 Personal reflection: The shifting threshold of risk.** Reflecting on BEIS later that evening, I wrote:

The more I develop relationships with this group, and the more I understand the severity of this issue, the more I feel it viscerally, the more action I want to take. [...] When you’re there with people you identify with and care for, who are risking themselves, you feel a strong compulsion to act too.

(fieldnote)

Within that space, everything felt heightened, urgent, emotionally charged, a convergence of personal commitment and collective action. Repeated participation can moralise identity and deepen commitment through moral emotions [43] and small-group bonds, shared goals, and solidarity are known to amplify willingness to act [98,99]. After the arrests, reactions among the remaining scientists diverged, some elated, some shaken, a few saying they might escalate again. The same episode produced different impulses, but a shared sense that *doing more* now felt thinkable.

Part of why it felt thinkable was what had happened in the days before BEIS. For me, sitting in the road near Trafalgar Square felt daring at first. The day after Trafalgar, I joined a bridge block at Vauxhall, and a police warning felt almost procedural. This rapid normalisation, hedonic adaptation, lowered the felt intensity of risk and, together with learning from others, built self-efficacy for navigating protest and its consequences [35,100].

Even so, at BEIS I chose to film rather than take an arrest-risk role. Initial barriers gave way to greater confidence and, for some, to civil disobedience, but the trajectory is neither inevitable nor uniform. The desire to escalate coexists with professional, personal, and ethical considerations. My threshold had risen, but I did not cross it. Distinct motivational pathways, emotion/identity versus problem-focused reasoning, can coexist and shift over time [101]. Sustaining and escalating scientist-activism is less a straight progression to higher risk than a continuing calibration of commitment, costs, and care.

## 4. Discussion

### 4.1 What this study shows

This ethnography traces a three-stage trajectory in scientist-activism: identity-aligned entry, negotiation and performance of the scientist identity in public action, and the non-linear work of sustaining commitment and escalating action. The psychological mechanisms familiar in collective action, collective efficacy, empowerment, solidarity and moral conviction, are

not unique to scientists [73], but here they intersect with professional norms, credibility concerns and the social meanings attached to scientific expertise. This extends recent work showing that scientists' willingness hinges on identity fit, credibility, and risk management [8,9,14] by making visible the practices through which those concerns are negotiated in situ.

#### 4.2 Identity-aligned spaces and unifying symbols

Entry points that align with scientific identity, such as public science communication and clearly scoped roles, lower first-step costs by legitimising participation and modelling how to “be a scientist” in action. In these identity-aligned spaces, peer support and learning foster belonging, self-efficacy, and empowerment, easing the transition into activism and helping participants work through tensions between science and protest [8,28,35,73]. Scientific symbols such as the lab-coat make scientist-activists visible and unified, and help seed a hybrid scientist-activist identity as a vehicle for social change [26]. Yet such symbols delimit who feels able to participate, particularly for social scientists who do not identify with laboratory dress [75,79].

#### 4.3 Sustaining and escalating action

Factors associated with sustaining action include moralisation and politicisation of the scientist identity; moral emotions (especially anger and moral outrage); feeling useful; and perceptions of collective efficacy and psychological empowerment within supportive groups. These align with prior work linking identity, emotion, moral values, and efficacy to continued participation [28,37,43,73]. In practice, care practices, self-determined skills-matched roles; explicit permission not to escalate; on-site wellbeing; and post-action debriefs, lowered perceived costs and buffered burnout.

These processes are further reinforced by the alignment of collective and individual aims: contributing to a group's goals can confer tangible psychological and social rewards such as enhanced self-esteem, empowerment, personal efficacy, relationships, and purpose (‘feeling one is doing the right thing’) [29,37,91]. In this way, individual benefits are intertwined with, and often emerge through, participation in collective action.

For some, these processes, combined with frustration at the perceived limits of conventional science communication, made non-normative tactics (including civil disobedience) feel proportionate, possible, and necessary, but not for all. Risk thresholds shift unevenly with experience and adaptation, while professional, personal, and ethical considerations continue to gate decisions [8,38,39,100]. In sum, sustained engagement reflects an ongoing calibration among identity, emotion, efficacy, and care rather than a linear progression to higher risk actions.

#### 4.4 Identity performance and audience interactions

Public action required performing a scientist identity before multiple audiences: public, police, fellow activists, media, each with different expectations. Dress and artefacts (e.g., lab-coats; pasted papers) signal role and status, shaping interactional openings and constraints [79,76,92]. Authority is interactional and contextual while the boundaries of “real science” are drawn and redrawn continually [89,102]. Symbols amplified visibility and sometimes smoothed interactions but also invited expectations of universal expertise and exposed intra-movement gatekeeping (e.g., “are you a real scientist?”). To mitigate the risk of straying beyond one's proximate expertise [88], participants clarified specialisms, used collaboratively prepared materials by respective experts, and, at times, stated scope and limits.

Evidence on the credibility impacts of scientist advocacy are mixed and depend on audience, context, and the form of action, as identified in a recent review into the reasons for, and consequences of, scientist advocacy [103]. Policy advocacy does not, in general, diminish credibility [104,105], and in certain cases can increase credibility [106]. However, context, political orientation of the audience, and the specific policy, affect this [105,107–110]. Initial work on more activist and disruptive forms of engagement has produced mixed results. Some experimental research found that civil-disobedience involvement did not undermine research credibility [111], while other research found no negative source or general credibility impacts when comparing environmental scientists who endorse protest with scientists who participate in either legal marches or civil disobedience [112]. However, other experimental research has found that scientists engaging

in conventional activism (i.e., holding a protest sign) were perceived as slightly less competent and more hypocritical than non-activist scientists, with stronger negative effects observed for scientists engaging in civil disobedience [113]. In addition, presenting oneself as an ‘activist scientist’ was found to negatively affect the scientist’s perceived reliability [114]. This mixed picture emerging from the most recent experimental work, coupled with contested views of advocacy and activism within the scientific community, highlights the need for more empirical research [103]. Relatedly, these credibility concerns sit within a broader political climate that is itself changing, shaping both the risks associated with public action and how scientists weigh decisions about whether, and how, to participate.

#### 4.5 The wider political context

Globally, the political climate has grown increasingly hostile toward climate activists alongside rising populism and misinformation [2,115,116,117]. In the UK, recent government rhetoric has framed climate activists as “extremist,” and introduced harsher penalties for peaceful civil disobedience, raising the material costs of participation [115,116,118–120]. For scientist-activists, these developments heighten concerns about personal risk, professional security, and reputational consequences, particularly for those in precarious positions or with immigration constraints.

At the same time, science itself has become politically charged, with public debates over neutrality, institutional independence, and the appropriate boundaries of scientific authority [121–124]. Recent ‘Stand Up for Science’ demonstrations across the USA and Europe [121], echoing 2017’s ‘March for Science’ [77], illustrate how scientific identity has been drawn into broader struggles over democratic norms and truth claims.

These broader shifts, alongside debates about the ‘right methods’ of activism [125], complicate decisions about whether, and how, to act: they heighten the stakes of public action, intensify scrutiny of scientists’ credibility and legitimacy, and make the performance of scientific identity in activist contexts an increasingly delicate task. This points to the strategic necessity of offering varied levels of engagement within movements, allowing individuals to participate meaningfully, even if they cannot afford high-risk roles.

#### 4.6 Implications for groups and institutions

This case study of S4XR points to practical design choices that helped some scientists participate and stay involved: clearly signposted low-risk entry roles; skills-matched, identity-consistent tasks during actions; optional pathways to higher-risk roles; and care woven into operations. Beyond street protest, scientists can contribute in a variety of ways to social movements (e.g., research and teaching) [126].

There are trade-offs. Bringing a distinct “scientist” identity into protest risks gatekeeping and misaligned expectations. To protect credibility while widening participation, groups should make expertise boundaries explicit, keep scientists’ roles transparent, and offer adjacent ally roles for non-scientists. Additionally, groups could diversify visual signifiers beyond the lab-coat and normalise a wider repertoire of “what a scientist looks like” in action.

Finally, insofar as some scientist-activism reflects frustration with the limits of conventional science communication, universities, funders, and professional societies may wish to revisit the science–society contract: broaden recognised routes to impact; acknowledge evidence-led public and policy engagement as legitimate scholarly work (e.g.,[10]), and offer clear guidance on rights, responsibilities, and reputational risk.

Of course, while this study focused on scientists who choose to enter activist spaces, it represents only one of several routes for engagement with the climate crisis. These include conventional science communication, adjusting personal behaviour, or engaging in activism as a private citizen thereby separating their scientist and activist roles.

#### 4.7 Limitations and future directions

As a single-case ethnography, the aim was not population-level generalisation but to offer process insights that readers can assess for applicability in comparable contexts. The author’s positionality negotiated access to processes that are

hard to capture otherwise but also risks over-identification. Triangulation with public documentation and academic literature helped mitigate this. The study does not quantify audience effects, nor does it compare alternative iconographies or organisational models across settings.

Nevertheless, the research has identified various avenues for future research. First, performance of scientist identity and expertise: when and how do visible cues and role claims unify or divide scientists across disciplines and career stages; what alternative ways of signalling expertise make diverse contributions legible without reproducing hierarchies? Second, how does performance of expertise shape interactions with different audiences: under what conditions does public action by scientists maintain, enhance, or erode perceptions of credibility and trust in science, and how do these effects vary across political orientations, media framings, and repertoires of action? Third, biographical consequences: what are the longer-term trajectories of participants, do they remain in their disciplines and roles, shift agendas, or move into new ventures? Comparative ethnographies and longitudinal designs (across countries, disciplines, and movement contexts), coupled with experimental and mixed-methods studies of audience reception, would test the scope and limits of these processes beyond this case.

#### 4.8 Concluding reflection

As a researcher and participant in these spaces, I find myself continually reflecting on what it means to respond to a crisis of this scale. The growing urgency of climate change, alongside the political and social constraints on action, prompt difficult questions about responsibility, risk, and impact. My research and experience attest that there is no single “right” way to contribute. Rather, scientists, and indeed all members of society, must navigate a spectrum of possible responses, balancing professional, ethical, and personal considerations in responding to the climate and nature crisis.

#### Supporting information

##### **S1 Table. Fieldnotes template.**

(DOCX)

##### **S1 Appendix. Further research context.**

(DOCX)

##### **S2 Appendix. Autoethnography further detail.**

(DOCX)

##### **S3 Appendix. Illustrative diary excerpt.**

(DOCX)

##### **S4 Appendix. The ethics of activist research.**

(DOCX)

##### **S5 Appendix. Media sources.**

(DOCX)

#### Acknowledgments

I thank Dr. Nuri Kwon (ORCID: <https://orcid.org/0000-0003-0503-1343>) for creating the original icons and graphical elements used in [Figure 1](#), and for granting permission for these to be published under the CC BY 4.0 license. The author thanks Fabian Dablander, Mark Levine, Jared Piazza, Anna Sach, Maien Sachisthal, and Aaron Thierry for comments and feedback on earlier versions of this manuscript.

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