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ALBERT

The impact of climate content

Catherine Graves, Jon Swords & Lucy Morris
BAFTA albert | University of York

Research insights

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1. About

About albert

albert is the leading screen industry organisation for environmental sustainability.

Founded in 2011, albert supports the film and TV industry to reduce the environmental impacts of production and create content that supports a vision for a sustainable future.

The BAFTA-owned, industry-backed organisation offers online tools and training, events, practical guidance and thought leadership to all screen industry professionals, helping them identify and act upon opportunities on and off screen which can lead to effective climate action.

About SIGN

The Screen Industries Growth Network (SIGN) is a unique, business-facing initiative supporting the TV, film and games industries in Yorkshire and the Humber. SIGN aims to make this region the UK's centre for digital creativity, and a model of diverse and inclusive activity. In order to do this, SIGN connects companies, support agencies and universities through a programme of training, business development, research and evaluation. SIGN is a £6.4M project, starting in summer 2020, and funded by Research England, the University of York and its partners. The University of York leads the initiative, working with Screen Yorkshire and eight other Yorkshire universities. An extensive network of collaboration ensures that SIGN is equipped to deliver maximum impact across the region.

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2. Executive summary

The screen industries have unparalleled cultural reach, and play a key role in shifting social norms, providing both an information source and highlighting positive role models.[1] This has been evidenced especially in relation to behaviours relating to health (for instance car safety, smoking and HIV/AIDS awareness),[2] however more attention is now being given across the industry to the potential to shift the narratives relating to climate change and sustainability.

Addressing the global challenge of climate change presents opportunities for content on screen to be at the forefront of social change. It is also an opportunity for the content to be enriched by aligning with audience values and tapping into the intersectionality of climate change with a range of social issues which are relevant and matter to audiences.

At COP26 in Glasgow, albert brought together 12 broadcasters and streamers from the UK and Ireland to sign the climate content pledge,[3] which committed them to six core principles in support of 'more and better climate content'. This research aims to support this commitment by providing an evidence base regarding what and how climate content can impact audiences' pro-environmental behaviour.

This research explores: the existing evidence on the impact of climate content on audiences from a 'pro-environmental behavioural' perspective; what the audience demand for climate content is and what audiences want it to achieve; and finally, the audience response to different types of climate content.

Through this multi-phase research, there are five key takeaways:

1. There is demand for climate content across a range of genres, especially that which intersect with social and environmental issues (e.g. inequality, health, nature and biodiversity loss).
2. Climate content is proven to raise audiences' interest and concern for climate change and environmental issues considerably. The effect on audience behaviour is complex, with positive changes often short-lived[4] and dependent on audiences' pre-existing values.
3. UK audiences are most interested in climate content which shows the impacts of climate change in the UK, portrays achievable solutions and provides information on climate science.
4. The likelihood of positive audience impact was increased through the use of post-viewing support, collaboration with a range of experts, integrating climate content authentically, and through working from a values-first approach by aligning content with the anticipated audiences' pre-existing values.
5. Incidental and intrinsic climate content elicited similar positive behavioural responses, with intrinsic content impacting a slightly wider array of specific pro-environmental behaviours. Both intrinsic and incidental climate content significantly increased audience concern for global issues and climate change.

By mainstreaming climate-compatible decision-making into all stages of content creation, content can be made which reflects audience values and interests around climate change, and visualises and facilitates a just transition.[5]

3. Climate change on screen

Climate change is everything change.

Climate change is the biggest story of our lifetime. It affects the conditions in which we live and work, not just in terms of rising temperatures, more frequent extreme weather events such as flooding and droughts, or rising seas, but across every component of life.[6] Rising food and energy costs, issues with water supply, infrastructure degradation and transport disruption are some of the climate impacts which are, and will continue to be, felt in the UK. These issues, and others, intersect with other social challenges which result in those in more vulnerable groups being disproportionately impacted. It has been conclusively shown that "emissions in all different [household] areas rise with income" (p. 115),[7] and the people who have the least responsibility for contributing to climate change are the most vulnerable to its impacts, in the UK[8,9] and abroad.[10,11]

However, action on climate mitigation and adaptation, from the individual to international level, can make a positive change, and there is public demand for this action.[12] TV and film media have a critical role to play in engaging audiences in debates regarding the transition to net zero and shaping the societal story around action to prevent climate change.[13] Content such as 'An Inconvenient Truth' (2006), 'The Age of Stupid' (2009) and 'The Day After Tomorrow' (2004) became household names while prompting a societal discussion around environmental and climate issues, and crucially can have a behavioural impact on audiences.[14]

However, climate content goes beyond overt storylines about climate science, sci-fi dramatisations of the impacts 50 years from now, or documentaries about electric cars or hydrogen technology. It can include climate content which integrates production design to show a climate-compatible future, integrating storylines about innovation or new jobs across genres by utilising humour or drama, or mainstreaming climate content decisions into sport or entertainment programming. Climate content presents a wealth of creative skills building and economic opportunities, as well as the possibility to create positive social and environmental impact. This can be manifested by telling the story of climate impacts and climate action (with huge opportunities to integrate climate change into stories involving social issues), and by visualising and showing the just transition or a climate-compatible society on screen, and by showing 'ordinary people' taking actions.[1]

> **If we want audiences to care about the world and motivate them to act to protect it, we must not underestimate the value of climate storytelling on screen.**

This report presents research which explores how climate content in TV and film has impacted audiences' pro-environmental behaviour, with recommendations for the industry.

4. Methodology

This research project was composed of three phases in order to examine audience demand for, and response to, climate content.

The first phase involved conducting a rapid evidence synthesis to systematically gather and examine the most recent academic work, structured around the research question "what effect does climate content in TV and film have on audiences' pro-environmental behaviour?". This provided the grounding and evidence base for the following phases of work, as well as identifying the most relevant research questions to ask, by exploring the research and evidence landscape. The findings from this phase were published in a previous piece[15] and are summarised in the next section. Detail on the methodology involved can be found in Appendix A.

The second phase constituted conducting a large-scale survey of the UK population in May 2023, exploring audiences' existing viewing patterns and demand for content with climate or environmental themes. The survey was structured around four sections; viewing habits, global issue concern, perception of climate content and demand for climate content. The 801 respondents who participated were representative of the UK population across gender, age and ethnicity. More information on the questions asked and methodology can be found in Appendix B.

The third phase focused on conducting a quasi-experimental design in order to explore the audience response to different types of climate content, namely the comparison between response to intrinsic and incidental climate content. A range of pro-environmental behavioural determinants and outcomes were measured, as well as emotional responses and climate message interpretation. 640 people participated in this experiment, divided evenly between the two experimental conditions. More information on the experimental design and methodology can be found in Appendix C.

Intrinsic content is defined as having climate change or sustainability as a key theme or narrative. Incidental content is defined as mentioning climate change or sustainability in passing or showing sustainable actions on screen.

5. Phase 1

What does the existing evidence tell us about the impact of climate change on screen on audiences' pro-environmental behaviour?

This phase examined relevant existing evidence, under the overarching research question "what effect does climate content in TV and film have on audiences' pro-environmental behaviour?". This enables a better understanding of the existing research and evidence landscape in order to provide grounded recommendations to the industry and to help formulate Phase 2 and 3 of the research.

Research was gathered from peer-reviewed publications conducted since 2000 which examined the effect of English-language TV and film content on audiences' pro-environmental behaviour. The key findings were synthesised and are outlined in themes below, with more detail in the **Phase 1 report.**

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5.1 Key takeaways

Five key areas of research emerged, with recommendations for the industry:

Characters

- Utilising characters and talent that audiences relate to, not just in terms of life experience and community, but through characters who align with audience values, beliefs, motivations and social norms, increases engagement.
- The role and importance of trusted messengers repeatedly arose in the research. Utilising trusted messengers increases legitimacy and approachability of the content, by reaching audiences where they already are with voices they already know.
- Avoid characterising environmentalists as unrelatable, unusual or 'other' as this reduces engagement with the characters and messages.

Script

- How scripted content portrays climate change has been extensively researched, especially in regards to positive and negative framing. Highlighting the causes and impacts of climate change alone can raise awareness among audiences, but can also lead to audiences feeling overwhelmed and apathetic, as can dramatisations of climate disasters.
- Positive framing, through solutions or opportunities to address climate change, can be more engaging and increase audiences' self-efficacy. This doesn't only have to apply to overt climate storylines, as incidental references to climate or sustainability can be reframed positively without altering the story.

Opportunities across genres

- The majority of the research has focused on the impact of factual content on audience impact, however there is evidence of the effect of climate content across other genres such as sci-fi, comedy and drama.
- Integration of climate content across genres can be effectively used to appeal to different audiences.
- This can most effectively be done by using the complexity of climate change to its advantage. Climate change is everything change, as climate change intersects with other social, environmental and economic issues. This content works best when aligned with audience values, motivations and beliefs around these issues.

Post-viewing support

The inclusion of post-viewing support was associated with the most significant increase in audience pro-environmental behaviour across the research. This included where further information was provided, additional resources were created and a call to action worked alongside the content.

Collaborations

Effective collaborations with climate scientists, policymakers, behavioural scientists, NGOs, those with local knowledge and other experts increases the effectiveness of on-screen content and off-screen impact (e.g. associated campaigns, resources or a call to action).

5.1

This research body shows the impact climate content has and can have on audiences. The evidence shows how climate content affects environmental concern, awareness, values and behaviours. However, behavioural science tells us (both within the pro-environmental behaviour sphere, and more broadly) that repeated exposure to messages is essential to maintain a long-term impact,[4] and although negatively valenced messaging increases environmental concern, positive messaging increases audience self-efficacy and agency to take action.[16]

'Good' climate content looks like content which is aligned with audience values, portrays accurate science (not just climate science), and leaves audiences with a positive sense of agency to facilitate action. The complexity of climate change can be seen as a creative opportunity to integrate climate content through intersectional issues such as health, inequality, marginalised communities and current economic crises.

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6. Phase 2:

What is the demand for climate content?

Portrayal of climate and sustainability issues in TV and film has huge influence over public discourse, individual action and systemic outcomes. Phase 1 explored the existing evidence base around the impact of climate content on audiences' pro-environmental behaviour, and it found a need for more work exploring what audiences want to see on screen. Therefore, this is the focus of Phase 2 of this research.

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6.1 How was this question explored?

A UK-wide survey tells us more about what audiences want to see on screen.

In order to explore the existing viewing patterns and demand for content with climate or environmental themes, a large-scale survey of the UK population was conducted in May 2023, with a view to further understand how climate content is perceived as well as the interest and demand for climate content. Existing industry research has explored the demand and impact of scripted content[17] and the role of content in nudging audiences pro-environmental behaviour,[18] so this research on audience demand adds to this growing body of work.

The survey was structured around four sections: viewing habits, concern for global issues, perception of climate content and demand for climate content. The 801 respondents who participated were representative of the UK population across gender, age and ethnicity. Audiences were engaged and concerned with a range of global issues, understand the need for climate content on screen – and want more of it.

> **The purpose of this research is to better understand the audience demand for climate content, and to utilise this to better identify solutions to support more and better climate content.**

This report presents a review of recent research exploring how climate content in TV and film has impacted audiences' pro-environmental behaviour, with industry recommendations. This aims to provide the industry with insights which not only help climate content be more impactful, but help to future-proof content to increase the longevity and relevance of film and TV. It is structured around the following research question: "What is the demand for climate content in TV and film within the UK?".

6.2 Key finding 1:

Audience perception of 'climate content' is heavily weighted towards factual and news content.

In order to understand how audiences perceive 'climate content', participants were asked where they noticed mentions of, or references to, climate change or sustainability themes. The findings demonstrate this was dominated by factual and news/current affairs genres (figure 1), and fairly evenly split between the other genres. This was supported by the data found when audiences were asked about their inspiring or memorable climate content memories, where references to natural history and documentary programming were the most common topics. Specifically, references to recent content such as '*Wild Isles*' appeared regularly (n=30). However, audiences also identified climate and sustainability storylines from other genres with participants citing '*Succession*', '*Years and Years*', '*The Day After Tomorrow*', '*Interstellar*', '*Top Gear*', '*2012*' and '*Race Across the World*' as content which they found inspiring or memorable, to highlight a few.

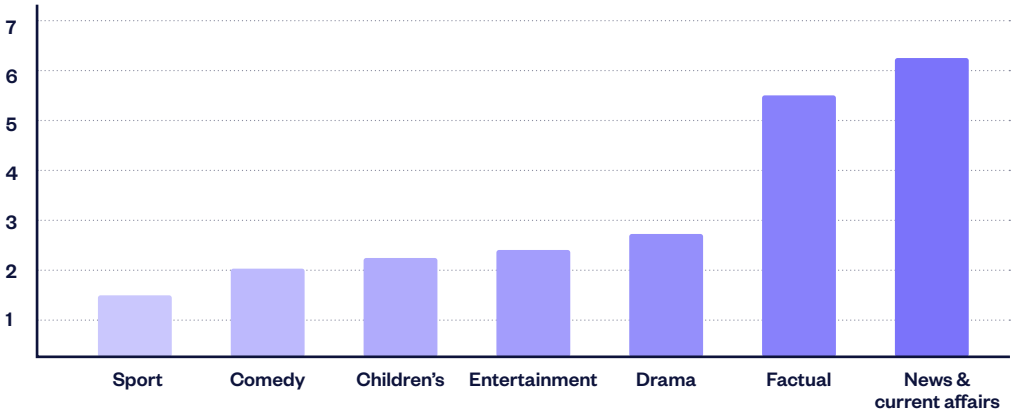

Figure 1: *In which genres have audiences noticed mentions of, or references to, climate change? (Mean scores; higher scores = higher prevalence of mentions or references to climate change)*

A key theme which emerged from the data, when participants were asked what moment/scene that touches on the climate crisis they found particularly memorable or powerful, was the role of trusted messengers. This relates clearly to findings in Phase 1 regarding the importance of relatable characters and trusted messengers and the role characters play in how climate content is perceived and received. For instance, David Attenborough was mentioned by 103 respondents (13%) as inspirational. Other trusted messengers such as Jeremy Clarkson and Stacey Dooley also appeared frequently in the data. This indicates an emotion or values-based connection to these trusted messengers across a range of genres and intended audiences.

Most of the perception of what is meant by 'climate content' focused on overt climate or environmental themes, leading to a dominance of factual and news references identified (as supported by data in Figure 1), with only a handful of participants identifying more subtle climate themes in other genres, or referencing issues which intersect with climate change such as social issues or injustice.

6.3 Key finding 2:

There is demand for more climate content.

Participants were asked in which genres they would like to see more climate storylines. The data indicates a high demand for more climate content in factual and news content (both scoring 7/10). This is interesting to note as the data found that audiences already perceive climate content to be high in those genres, yet there is still demand for more. The audiences expressed moderate demand for more drama and children's content to include climate themes, with lower demand for climate storylines across entertainment, comedy and sport. However, exploring the qualitative data adds further context to these findings. The research identified that the majority of participants understood 'climate content' to mean overt storylines around the science or impacts of climate change, as shown by the prominence of natural history and other factual content in their responses to what inspiring content they have watched.

When audiences were asked what content they found most memorable, a variety of responses emerged, from joyous moments of sporting success to memorable scenes of high drama in their favourite soaps. A key theme of responses were the emotional and values-based connection which corroborates the finding in Phase 1 where values emerged as a key determinant of impactful climate content.

The participants were asked which global issues they were concerned about, valued, or were interested in seeing depicted on screen. There was high concern across the participants for global issues: health and wellbeing, social issues and inequality, and biodiversity and nature were the top three issues (figure 2). All the issues showed high levels of concern across all demographic groups. These issues were selected for measurement as they are components of the complex issue of climate change. Although not directly comparable due to differing methodologies, IPSOS polling of UK concerns ranks inflation, healthcare and the economy as the top three national issues,[19] which potentially indicates a gap between national and global concerns. When asked what issues audiences would like to see on screen, biodiversity and nature was the highest-ranked issue, followed by social issues and inequality, and health and wellbeing. This indicates the breadth of opportunity for climate content that interests audiences, via a range of global issues.

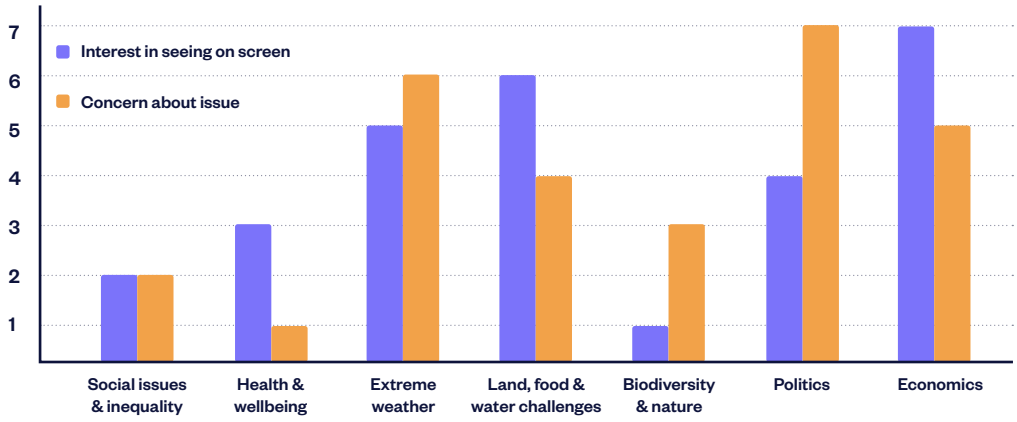

Figure 2: Comparison between concern for global issues and interest in seeing issues on screen (Ranked, 1=highest concern and interest, 7=lowest)

6.4 Key finding 3:

Show solutions and highlight systemic issues

Audiences were asked how they thought TV and film could be used to help viewers manage the climate crisis. Figure 3 illustrates that 'showing the impacts of climate change in the UK' was the most popular with UK audiences (31% of respondents ranking it 1st), with content being used to help overcome eco-anxiety ranked lowest (only 4% ranking it 1st). 'Showing achievable solutions' (22% ranked it 1st) and 'providing information on climate science' (15% ranked it 1st) also scored consistently highly across all demographics.

These findings were overwhelmingly supported by the qualitative data, which consistently identified themes of the need for systemic (government and business) action and responsibility. Participants commonly referred to emotional responses (guilt, sadness, helplessness) around personal responsibility, and often identified hypocrisy and injustice portrayed on screen and within broader society. This was the centre of negative reactance to their experiences of climate content; where content felt superficial, hypocritical or inauthentic. This data shows that there is clear demand for useful and impactful climate content, and by focusing on audience values and dealing with issues audiences are concerned about, negative reactance can be mitigated.

Example participant responses when asked what content is demotivating

"Being shown devastation but not being presented with realistic solutions that we can start at home"

"When characters in a drama or sitcom are showing always having (meat-heavy) takeaway food with no thought to the amount of waste that generates."

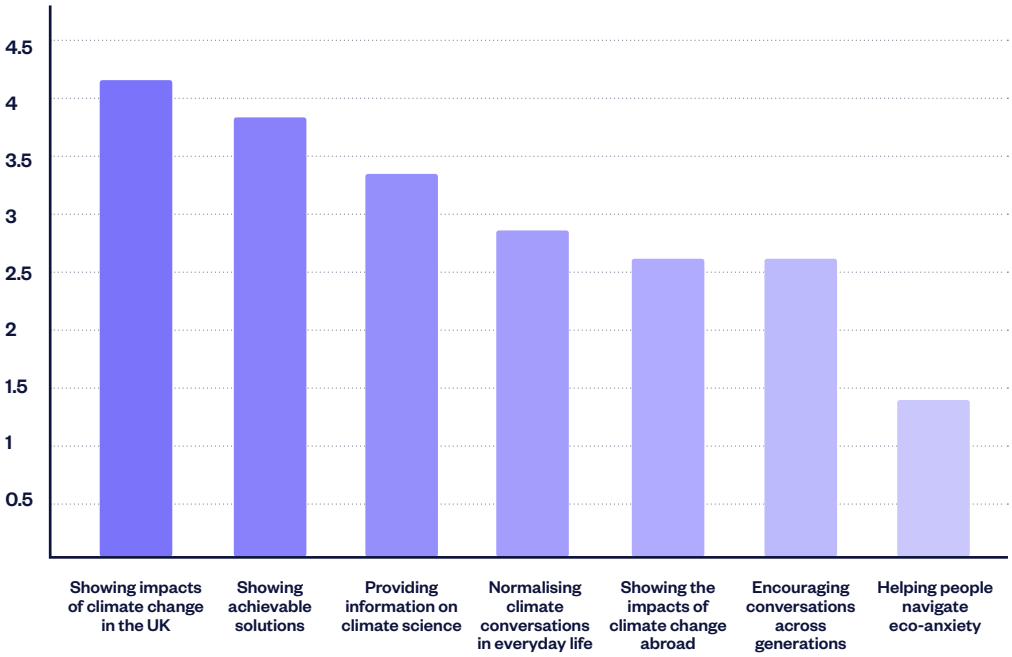

Figure 3: Average scores for uses for climate content (Inverted rank, 1=lowest usefulness)

6.5 Key finding 4:

Audiences want climate storylines that are relatable and foster emotional and value-based connections.

Audiences were asked what moments were inspiring or memorable in relation to climate change and what moments were uninspiring and demotivating. The key themes were developed through inductive analysis, and the ones which emerged from the four qualitative (free text) questions were:

- Notions of responsibility: individual, collective or systemic
- Authenticity of content
- Agency & solutions
- Trusted messengers
- Empathy and injustice

Concepts related to key factors underpinning behaviour change – people's values, beliefs, social norms and attitudes[20,21] – were regularly found. Inspiring or memorable climate content tended towards moments where connection, empathy or injustice was felt by the participants, and was dominated by references to wildlife documentary content which elicited an emotional response. References to trusted messengers were common, with key voices coming from authority figures, not isolated to climate science, but voices who are authorities in their own space, across genres or issues.

Regarding uninspiring or unhelpful content, audiences identified moments where climate change felt "tacked on" or "shoehorned in", which reduced their presence in, and relationship to, the scene. This was often referred to alongside references to the emotional context of the scene; whether it was providing a hopeful or positive solution/action, or simply highlighting the issues (e.g. "doom and gloom" content without providing solutions or enabling action).

> **"Cousin Greg losing his inheritance. What was a tragi-comic situation made me consider some kind of donation [to Greenpeace]." (in '*Succession*')**
> *Participant quote*
>
> **"[W]hen there's talk in a non-positive way and makes you feel like there's no hope, you feel like there's no point in even trying."**
> *Participant quote*

6.6 Key takeaways

The intersectionality of climate change with a range of environmental, social and economic issues presents creative opportunities.

1. **Values-first approach**
   Not every piece of content can appeal to, motivate or engage everyone. But considering how audience segmentation relates to climate and sustainability could help audiences feel the content is relatable.

2. **Audiences are astute to storylines which are 'shoehorned in' – it needs to be authentic**
   Authentic climate content can come from utilising the intersection of climate with other social and environmental issues.

3. **Tackle big-picture content**
   Themes of responsibility are in demand, not just around responsibility for climate impacts, but for action on climate too.

4. **Show solutions at all scales**
   Audiences want content to move beyond showing climate impacts, to "tangible" and "realistic" solutions. Showing and normalising solutions at a range of scales can be empowering.

5. **Consider climate across all components of content**
   Audiences referred to inspirational moments in many forms beyond scripted or verbal content, including elements of production design, non-verbal action, soundscapes, plot points and character traits.

7.1 Phase 3:

How do audiences respond to different types of climate content?

Intrinsic and incidental climate content

This section explores the audience response to incidental (or implicit) and intrinsic (or overt) climate content in TV and film. Incidental climate content is defined here as content where climate, environmental or sustainability issues are mentioned in passing or shown through non-verbal action, with the key component being that those issues are not the dominant theme in the scene or narrative. Intrinsic climate content is defined here as content which centres climate, environmental or sustainability themes within the plot or narrative as a key theme.

The Phase 1 synthesis found that experimental work exploring the audience behavioural responses to different types of climate content is in its infancy, especially in the context of high-impact behaviours (e.g. diet choices, transport decisions, etc).[26] It also found that the audience response to different types of climate was a key research gap, especially for genres other than factual and news, and content which includes climate themes or references incidentally. Therefore, this section aims to fill that gap. It explores audience responses to different issues portrayed through intrinsic and incidental content, using an experimental design. This section was structured through the overarching research question: "How effective is intrinsic and incidental climate content at impacting audiences' behavioural responses?". This was explored through three sub-questions:

1. How do intrinsic and incidental content affect audience concern for global issues including climate change?
2. How do audiences respond emotionally to intrinsic and incidental content?
3. How does intrinsic and incidental content affect pro-environmental behavioural determinants?

7.2 How is this question explored?

640 participants took part in this experiment with climate content.

An experimental design is used to explore these questions due to the experimental control it provides along with facilitating large-scale quantitative and qualitative data collection. This experimental design compares the effect of incidental and intrinsic climate content on a selection of behavioural determinants and outcomes. This focuses on measuring a small but targeted group of quantitative dependent variables, supplemented by the depth of the qualitative questions, enabling a focus on key indicators of audience response (social norms, emotional response and behavioural response).

A pre- and post-test experiment was conducted, with six short clips divided for use between the two conditions (intrinsic and incidental groups of participants). Each condition involved a survey measuring a range of pro-environmental behavioural factors, followed by watching three short clips of similar length, each followed by a post-test survey of pro-environmental behavioural factors (plus some additional qualitative questions to assess perception and understanding of the content).

The content was chosen for the experiment using an 'issue frame', i.e. clips were chosen which included themes related to three different climate-related issues: resource use, travel and system change. The survey on demand for climate content (phase 2 of this work) included questions on identifying climate content the participants had watched, and these answers provided the database for content selection. Final selection (where possible) was based on ensuring comparable genre, date of release, environmental themes and availability on the repository 'Learning on Screen'. More detail can be found in Appendix C.

Experimental design is a scientific method for testing research questions and allocating subjects to different conditions. This research utilises independent group experimental design (intrinsic and incidental groups).

7.3 Key finding 1:

Both intrinsic and incidental climate content increased audience concern for global issues

Participants' concern for global issues (including climate change) was measured before and after they viewed climate content. These global issues were chosen based on Howell's (2011)[1] methodology and adapted to include broad categories all related to climate change, with an additional separate climate change component:

- Social issues and inequality
- Health and wellbeing issues
- Extreme weather events
- Land, food and water challenges
- Biodiversity and nature
- Politics
- Economics
- Climate change

The majority of participants were either 'somewhat concerned' or 'very concerned' about global issues as a whole (incidental group post-test: 74%; intrinsic group post-test: 72%). When asked about climate change specifically, 79% of participants were somewhat or very concerned about climate change. This demonstrates a greater degree of concern for climate change when compared with other global issues.

The incidental climate content resulted in a statistically significant increase in overall concern for global issues after watching the climate content compared to the pre-test. An increase in concern was also found to be statistically significant for specific issues including 'extreme weather', 'land, food and water challenges', 'biodiversity and nature' and 'climate change'. The intrinsic climate content had a non-statistically significant increase in overall concern, but a statistically significant increase for 'extreme weather', 'land, food and water challenges' and 'biodiversity and nature'. This shows that both the intrinsic and incidental climate content had a similar positive effect on the participants' global issue concern, with incidental content having a slightly broader effect on concern levels.

7.3

Examining the degree of change over time (between before and after viewing the climate content) highlights the variance across the issue concern (figure 4).

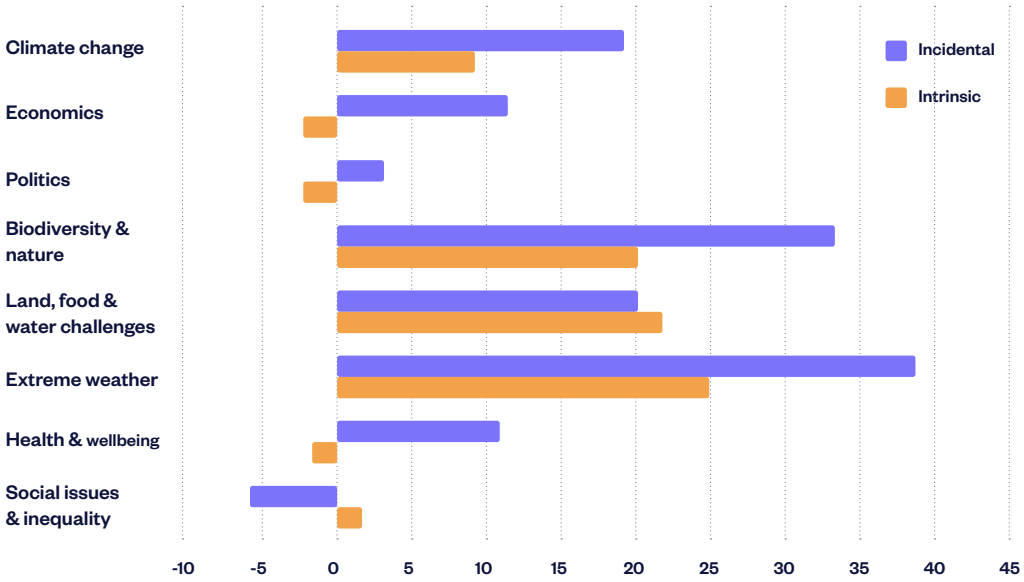

Figure 4: This graph shows the sum of change over time (before and after viewing the clips, for both groups) for concern for global issues. This is calculated by the sum of all respondents' change in their pre- and post-test global issue concern scores

This shows that, for 'climate change', 'biodiversity and nature', 'land, food and water challenges' and 'extreme weather', both groups showed an increase in their global issue concern after watching the clips (i.e. a positive change). The results are more varied for the other issues, which could be due to variance in the topics covered in the clips. This is discussed further in section 5.5 where participants' understanding of the environmental themes and messages in the clips are analysed.

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7.4 Key finding 2:

Intrinsic climate content had a greater positive effect on pro-environmental behavioural outcomes than incidental content

In order to measure the pro-environmental behavioural impact of the different types of climate content, participants were asked about a range of everyday behaviours before and after viewing the climate content clips. These questions were developed for Phase 2, included in the survey on demand for climate content and built from synthesising a range of pro-environmental behaviour research on high-impact behaviours (full details in Appendix C). Scores were calculated as a total across all components of behaviour. A higher score equated to more carbon-intensive behaviours, therefore a reduced score over time represents a positive change in behaviour.

The data found that there was a nominal positive pro-environmental behaviour change effect after viewing both the intrinsic and incidental climate content, although intrinsic climate content had a greater effect. One specific component of behaviour was found to significantly decrease (e.g. have a lower footprint) after viewing the incidental content which was 'consider environmental credentials for new purchases'. This directly relates to the content in one of the clips shown, focusing specifically on resource use in clip 1.

The data from the response to intrinsic climate content showed that three different components of behaviour had statistically significant changes after viewing the intrinsic content; these included 'driving distances of a mile or less', 'going on more than one return flight a year' and 'eating meat or fish'. Two of these three specific behaviours are travel-related, which could be related to the train travel clip (clip 2) that was viewed. The positive change in 'eating meat or fish' behaviour is interesting and could indicate spillover effects on behaviour, where a positive change can have knock-on positive changes in other areas of life.[22,23]

In order to assess 'plot connectedness',[24] participants were asked three questions measuring how central climate change was to the plot, in order to explore how this could affect audience impact. This can then be compared to the qualitative data on how clearly participants identified climate content in the clips. For each clip, participants were asked whether:

- Climate change references are relevant to the story
- Without references to climate change, the story would be different
- Climate change is connected to the plot

7.4

Across all clips and across both groups, 'climate change references are relevant to the story' received the highest agreement score of the three categories. The metric was measured on a scale of 1-5 (strongly disagree to strongly agree). As figure 5 shows, all the intrinsic clips score above 2.5, indicating that the average participant identified climate change themes in all clips. There is greater variance in the incidental group, with clip 2 (the travel clip) showing high agreement that climate change is relevant to the plot, whereas there was slight disagreement about the relevance of climate change in clips 1 and 3. Interestingly, both travel clips (clip 2) scored significantly higher than the resource use and system change content, across both intrinsic and incidental content, indicating that these scenes were identified as more closely related to climate change than the other clips. Although the intrinsic and incidental clips cannot be directly compared due to the multitude of variables which cause them to differ, trends can be inferred from this data (see figure 5).

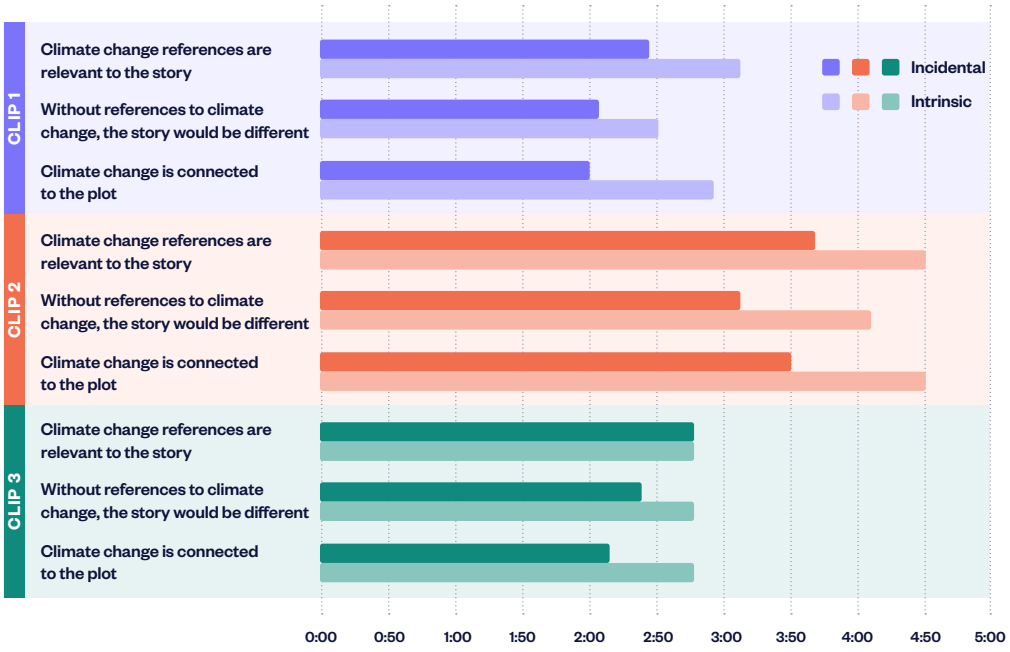

Figure 5: A comparison between the components of mean 'plot connectedness' scores across intrinsic and incidental climate content

Considering how plot connectedness intersects with participants' pro-environmental behaviour scores can indicate how behaviour was affected by the degree to which participants identified climate change as relevant to the plot. The relationship between high-impact behaviour and plot connectedness (for all three clips) was investigated through Spearman's correlation.

For the incidental climate content group, there was a small negative correlation between behavioural scores and plot connectedness. This indicates that, for participants who found climate change was more relevant to the plot, they had a lower (i.e. better) behavioural environmental impact score – and vice versa. This was found to be statistically significant across all three clips, implying confidence in the findings, although the effect size was relatively small.

7.4

For the intrinsic climate content group, there were similarly small statistically significant negative correlations between behavioural scores and plot connectedness, with the exception of clip 3 (about financial donations to environmental groups), which had a non-significant result. This shows that, as with the incidental climate content, a lower (i.e. better) behavioural environmental impact score is correlated to higher perceived relevance of climate change in the clips.

A caveat to these findings, as with a lot of behavioural and psychological research, is that the participants are self-reporting their own behaviour, therefore the change over time could be affected by social norm biases. However, this potential impact on social norms is an interesting possible effect of the content in its own right.

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7.5 Key finding 3:

Enjoyment of content was high across both intrinsic and incidental content

The survey on demand and interest in climate content on screen asked participants for their experiences of climate content which they found unhelpful or uninspiring, and a key theme identified was around content which was "tacked on" and felt inauthentic. Therefore in this experiment, the data was explored to see whether those themes emerged in response to the climate content participants were shown. This was measured by a compound metric of emotional response,[25] and through the qualitative questions around climate message perception.

Emotional response to each clip was measured using four components (enjoyable/not enjoyable, entertaining/not entertaining, interesting/not interesting and likeable/not likeable) on a 1-5 Likert scale (strongly disagree to strongly agree). All clips shown elicited moderate to high positive emotional response (figure 6 below), with climate content which is explicitly referenced or integrated as a core theme scoring similarly well to climate content which is more subtly mentioned or briefly referenced. As the pieces of content cannot be directly compared statistically due to the array of differences between them which could affect results, the qualitative findings can help explore this in more depth.

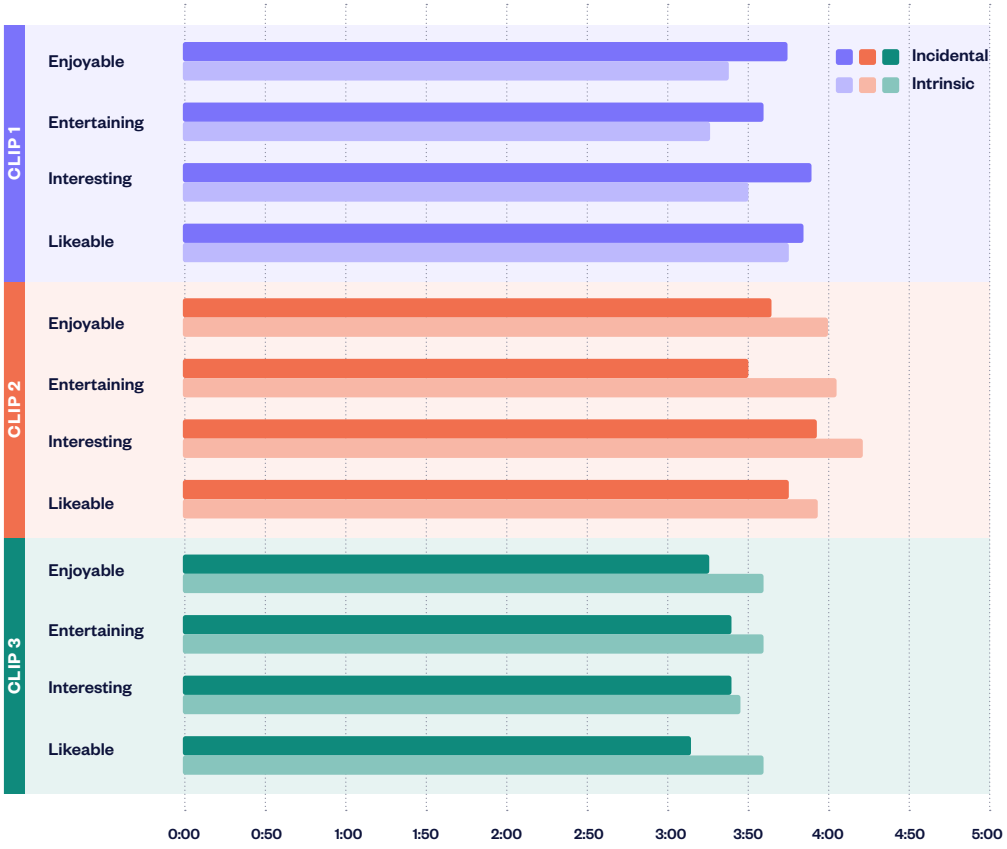

Figure 6: A comparison of mean emotional response data across intrinsic and incidental content

7.5

The qualitative data was explored using a priori coding[1] developed from findings in Phase 2 of this research around demand for climate content, specifically in relation to the negative anticipated reactance audiences felt. The data above shows how relevant and central climate change was to the plot (figure 5), which indicates that participant interpretation of the connectedness of climate change varied slightly, but none of the six clips used elicited a strong negative reactance in the qualitative data: all clips seemed to integrate climate themes authentically and without a significant disagreement around the connectedness. The qualitative data supported this, with relatively little negative reactance. The exceptions to this were found to manifest in two dominant ways. Firstly, as found in the demand for climate content survey, some respondents identified the climate references as unnecessary, with references to preferring escapism content, not wanting to be reminded of these issues, and comments associated with climate scepticism, although this was a small minority. The second key theme amongst respondents who experienced a negative reactance was around climate content which treated the issue too lightly. There were references to unnecessary jokes and the use of humour, as well as repeated reference to taking the issue of climate change more seriously and dealing with it on screen in more detail. There were also respondents who referenced wishing content would address systematic or "big-picture" issues related to climate change, which corroborates the data found in the survey on demand for climate content on screen.

> **We found that enjoyment in response to all content was high, and the negative reactance that audiences anticipated feeling in Phase 2 did not materialise.**

The survey showed what climate content audiences want to see on screen, and that audiences are astute to inauthentic climate content, or content that is "tacked on" and "shoehorned in". This was explored in the experiment by asking participants about their interpretation of the messages within the content, and what environmental or sustainability themes they identified. Participants accurately identified the environmental and sustainability themes in both intrinsic and incidental content, although there was more misunderstanding and conflation of sustainability issues in the intrinsic content (e.g. conflating air pollution with climate change). The survey also found how audiences wanted climate references not to be skated over, and wanted climate content to be dealt with in more detail, which could mitigate the risk of audiences misunderstanding or conflating climate and sustainability issues.

[1] A priori coding: themes and codes which were pre-determined based on findings from Phase 2.

7.6 Key takeaways

Audiences respond positively, emotionally and behaviourally, to both intrinsic and incidental climate content

1. **Both incidental and intrinsic climate content can be integrated confidently and authentically in content**
   Both intrinsic and incidental climate content had a positive impact on raising awareness, emotional connection and behavioural impact among audiences, as well as eliciting enjoyment; showing how climate content can be enjoyable and impactful.

2. **The change in specific audience behaviour related to the content they viewed**
   Both groups increased their pro-environmental behaviour. The significant changes in behaviours were identified to relate directly to the content; there was a significant reduction in intention to take flights and drive short distances after viewing a train travel clip (intrinsic group). There was a significant change in considering environmental credentials when purchasing after viewing a clip on resource use (incidental group). Considering how 'aspiration' is used can have a tangible impact on audience behaviours.

3. **Negative reactance to climate content was low**
   Negative reactance identified in the survey on demand for climate content found an anticipated negative reactance where climate change felt tacked on or shoehorned in. This wasn't identified in the content used in the experiment, as climate change was seen as relevant to the plot across all six clips. The qualitative data shows that negative reactance was low for both groups, although marginally higher in the intrinsic content.

4. **Avoid negative reactance by not skating over climate**
   A caveat to this is when incidental climate content produces a negative reactance, which was found in the qualitative data, as participants identified the humorous and light-hearted climate change references as 'diminishing' the message. Care needs to be taken not to 'trivialise' the issues.

8. What makes good climate content?

Climate content can authentically reflect audience concern and interest in climate issues.

This research project set out to explore the impact of climate content in TV and film on audiences' pro-environmental behaviour. This research question was applied to three phases of work and methodologies. Phase 1 constituted an evidence review synthesising existing work in this space, Phase 2 involved a survey on the demand and interest in climate content (using a representative sample of the UK population), and Phase 3 utilised an experimental design to measure the audience response to intrinsic and incidental climate content.

This research shows that audiences are interested in the issues of climate change and sustainability, they want to see it on screen, and respond positively to an array of ways of integrating climate content across genres. It found that TV and film can effect positive pro-environmental behaviour in audiences across genres without requiring overt climate themes or storylines in the content.

Audiences want content that addresses the big questions of climate change, around systemic issues and large-scale change, and a solutions-focused lens can help achieve that. This doesn't only apply to overt or intrinsic climate content, as the experiment showed how content does not need to be 'on the nose' to be impactful. The survey showed that audiences want climate content to show the impacts of climate change in the UK, show solutions to climate change and inform audiences about climate science. The evidence synthesis found how impactful climate content is content which is mainstreamed into different genres and programming in order to show audiences causes, impacts and solutions to climate change. It found how the effectiveness of this can be improved through the use of experts collaborating on content creation to enable evidence-based scripts and narratives, as well as through impact production. This can be in the form of a call to action, either explicitly or through showing positive behaviours or solutions on screen. Post-viewing support in the form of resources, campaigns and opportunities to act had the biggest impact on audience outcomes, especially self-efficacy, and collaborating with organisations working in that space can help create measurable outcomes.

[1] A priori coding: themes and codes which were pre-determined based on findings from Phase 2.

8.

This research showed the positive impact of climate content across different genres, issues and methods of messaging. After three short clips, the majority of participants increased their concern about environmental issues, and this translated to some increase in pro-environmental behaviour. The specific behaviours which became more pro-environmental can be directly related to the content of the clips, where the understanding of the climate and sustainability themes were more clearly understood (e.g. with both the intrinsic and incidental travel clips). The impact of this and potential co-benefits of climate content warrants further research.

The content used in the experiment varied across genre and type of programming, and crucially, the types of anticipated audiences. Understanding audience values, motivations and beliefs is required in order to align the right framing for climate content with the anticipated audience. Characters, presenters and talent are often huge draws for audiences to watch content. How these characters present aspiration opens a huge opportunity for engagement with issues or low-carbon behaviours without significant or meaningful shifts in narrative or production design.

> **This evidence can provide confidence to the screen industries that audiences are interested in these issues and can be used to create vibrant content.**

The complexity and intersectionality of climate change presents an opportunity to create incredibly impactful content, build industry capacity and skills, and future-proof content, by integrating climate change into narratives and production design across a whole range of social, environmental and economic storylines, in order to reach broader audiences – and to reach people where they are at.

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10. Appendix A:

Phase 1 methodology

10.1 Rapid evidence synthesis protocol

Background of review

Communicating environmental sustainability issues effectively is absolutely vital to enable structural and behavioural changes to take place at the pace we know they must. Consumption behaviours account for around 26.1% of the UK's total emissions (ONS, 2022), and although structural, 'top-down' governance must drive and facilitate change, individual and household behaviours have potential to make a huge difference to the interrelated crises of climate change and ecological decline.

The framing of environmental sustainability issues in TV and film plays a huge role in the public discourse around these problems (Sakellari, 2015). Content such as '*An Inconvenient Truth*' (2006), '*The Age of Stupid*' (2009) and '*The Day After Tomorrow*' (2004) became household names while prompting a societal discussion around environmental and climate issues, and crucially have a behavioural impact on audiences (Bilandiz and Sukalla, 2019). Communicating climate content can manifest in many other ways, aside from centring climate as a key theme. TV and film can be a hugely powerful tool for shifting norms, for instance by showing 'ordinary people' taking actions (Howell, 2011). More research is needed to explore the pro-environmental behavioural impact across a range of messaging and framing approaches in TV and film.

This evidence is the first part of a larger study exploring the effect of different messaging techniques in TV and film on audiences' pro-environmental behaviour. The evidence is likely to be spread across disciplines and outlets, with industry and consultant-produced reports likely to constitute a significant portion of the work. Therefore, a rapid evidence review is necessary in order to collate this disparate evidence systematically and ensure a comprehensive coverage of evidence.

Objectives

The purpose of this research is to collate the existing research and evidence, in order to explore the question "what effect does climate content in TV and film have on audiences' pro-environmental behaviour?".

The outputs from this review will provide the grounding for the research project, and directly feed into an experimental design exploring the effect of different messaging approaches on pro-environmental behaviour. It will also provide practical direction and case studies, the learnings of which can be translated into industry-relevant guidance.

Themes were drawn out from these answers and iteratively developed. The recommendations for industry form the majority of the outputs reported.

10.2

Inclusion/exclusion criteria:		
	Inclusion	**Exclusion**
Population	English-language content and publications	
Intervention	TV and film content (all genres)	News media (non-broadcast) Social media
Comparison	Framing, messaging and narrative approaches Behavioural outcomes	
Outcomes	Pro-environmental behaviour/ behaviour change. Including: Environmental concern, environmental knowledge, environmental awareness, Environmental attitudes, Environmental values, Behavioural intention, Measured behaviour, Connection to nature, Habits, Psychological distance, psychological barriers	
Study design	Empirical study Case study Experimental Quasi-experimental Qualitative/mixed methods	Theoretical development Modelling Review Conceptual and discussion pieces
Time	Since 2000	Pre-2000
Type of publication	Academic publications (including pre-registered reports, peer-reviewed literature, institutional reports etc.)	Conference papers
Other considerations		If full text not available through University of York

10.3 Search strategy:

Electronic databases	Electronic databases: Web of Science, Scopus, Google Scholar. The first 200 results from Google Scholar will be manually sifted and this will be assumed to be sufficiently comprehensive due to time limitations.
Hand searching	Up to five key papers will be identified based on citations, and the reference lists for these will be hand searched for additional relevant studies. Additionally, three key journals will be used for citation searches (Media Psychology, Environmental Communication and the Journal of Environmental Psychology), by searching the most recent three years of publications for relevant results not already captured. This phase will also act as a sense check for the existing publications identified – if the references are missing, the search strings will be adapted and re-run.
Compiling	Results will be compiled in Zotero and search strings and returns compiled in Excel.

10.4 Review methods:

Reviewers	Two researchers will conduct the review, with the lead researcher collating the search strings, and both researchers involved in sifting the results (50:50). Two rounds of sifting will enable greater rigour within this process. At both sifting stages, both reviewers will have 10% crossover, and if there is a discrepancy of >20%, another 10% of results will be sifted independently. Any discrepancies will be discussed and a final decision made.
Sifting	First sift: application of inclusion/exclusion criteria to title and abstract. Second sift: application of inclusion/exclusion criteria to full paper. This will be recorded in PRISMA protocol.
Data extraction	Data from included studies will be extracted in Excel. The data extraction framework will be developed iteratively based on key paper analysis, and will be focused on outcomes and study design.
Quality/risk of bias appraisal	The critical appraisal is based on Treloar et al. (2000)'s critical appraisal framework for qualitative research, with wording slightly amended to apply to quantitative, qualitative and mixed methods research.

10.5 Synthesis approach

A narrative and thematic synthesis will be conducted, as due to the breadth of the literature, a meta-analysis is precluded.

The main synthesis areas are:

1. Identify messaging and framing approaches used, and the behavioural outcomes.
2. Identify the metrics used to measure impact.

10.6 Outputs

Protocol	Will be uploaded to the Open Science Framework (by end of December 2022)
Industry communications	The findings will feed in to a larger piece of work, which will be disseminated to the industry between July-September 2023.
Peer-reviewed academic paper	Aim to complete full paper for submission by March 2024.
Quality/risk of bias appraisal	The critical appraisal is based on Treloar et al. (2000)'s critical appraisal framework for qualitative research, with wording slightly amended to apply to quantitative, qualitative and mixed methods research.

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11 Appendix B:

Phase 2 methodology

11.1 Survey design

1. Viewing habits

A. How many hours a week do you spend watching TV and film?

- 1-5 hours per week
- 5-10 hours per week
- 15-20 hours per week
- 20-25 hours per week
- 30+ hours per week

B. Which different genres do you tend to watch in an average week?

Please rank in order of frequency (1 = most frequent, 7 = least frequent)

- Entertainment
- Factual entertainment
- Sport
- Factual
- Continuing drama
- Scripted drama
- Children's
- Scripted comedy
- Comedy

2. Global issue interest

A. Which themes or storylines are you interested in watching on screen?

(Move the slider between 0-10; 0 = no interest, 10 = super interested!)

- Social issues and inequality
- Health and wellbeing issues
- Extreme weather
- Land, food and water challenges
- Biodiversity and nature
- Politics
- Economics

B. Please name any TV programmes or films which you have seen recently which touch on any of these issues?

10.2

3. Climate Content

A. In which genres have you noticed mentions of or references to climate change?
(e.g. Ewan Roy in Succession donating to Greenpeace, or in Richard Osman's House of Games where contestants guessed how many plastic bottles a person uses a year)

- Entertainment
- Factual entertainment
- Sport
- Factual
- Continuing drama
- Scripted drama
- Children's
- Scripted comedy
- Comedy

B. Where would you like to see more climate change storylines?
Please move the slider between 0-10 (0 = fewer mentions, 10 = more mentions)

- Entertainment
- Factual entertainment
- Sport
- Factual
- Continuing drama
- Scripted drama
- Children's
- Scripted comedy
- Comedy

C. How do you think TV and film can help viewers manage the climate crisis:
(Tick all that apply)

- Providing information on climate science
- Showing achievable solutions
- Showing impacts of climate change in the UK
- Showing the impacts of climate change abroad
- Helping people navigate overwhelming feelings – such as anger, grief, anxiety, fear, loneliness – caused by the climate crisis
- Normalising climate conversations in everyday life
- Encouraging conversations across generations

10.2

4. Behavioural determinants:

A. How concerned are you about the following issues:

- Social issues and inequality
- Health and wellbeing issues
- Extreme weather events
- Land, food and water challenges
- Biodiversity and nature
- Politics
- Economics

B. How often do you do the following actions?
(Items are rated 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Often) or 5 (Always))

- Drive distances of a mile or less
- Eat meat or fish
- Turn off appliances when not in use
- Consider environmental credentials for new purchases (e.g. energy rating, sustainable materials, distance travelled)
- Go on more than one return flight a year
- Have more than one meat-free day per week
- Talk about climate change to friends and family
- Vote based on environmental issues

5. Qualitative:

A. Please describe a moment/scene in a TV show or film that you found particularly memorable or powerful; and why?

B. Please describe a moment/scene in a TV show or film, which touches on the climate crisis, that you found particularly memorable or powerful; and why?

C. Please describe a moment/scene in a TV show or film, which touches on the climate crisis, that you found particularly uninspiring, unhelpful or demotivating; and why?

6. Demographics:

A. How old are you?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

B. What gender do you identify as?

C. What is your ethnic group?

D. What is your political affiliation? *(left, right, centre, prefer not to say)*

E. Would you like to receive a copy of the research report generated from this survey?

11.2 Demographic breakdown

The demographics of the participants are representative of the UK population, which match UK demographic representation.

What is your ethnic group?	Number of participants
African	14
Arab	4
Bangladeshi	6
Caribbean	9
Chinese	13
Indian	19
Other	38
Pakistani	8
White (English / Welsh / Scottish / Northern Irish / British)	658
White (Gypsy or Irish Traveller)	1
White (Irish)	8
White and Asian	7
White and Black African	2
White and Black Caribbean	3
(blank)	10

Table 1: The breakdown of participant ethnicities from phase 2

10.2.2

Figure 7: Age bracket breakdown of phase 2 participants

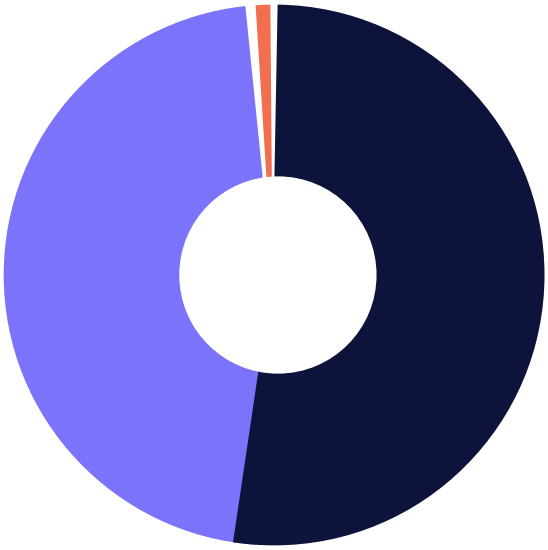


Figure 8: Gender breakdown of phase 2 participants

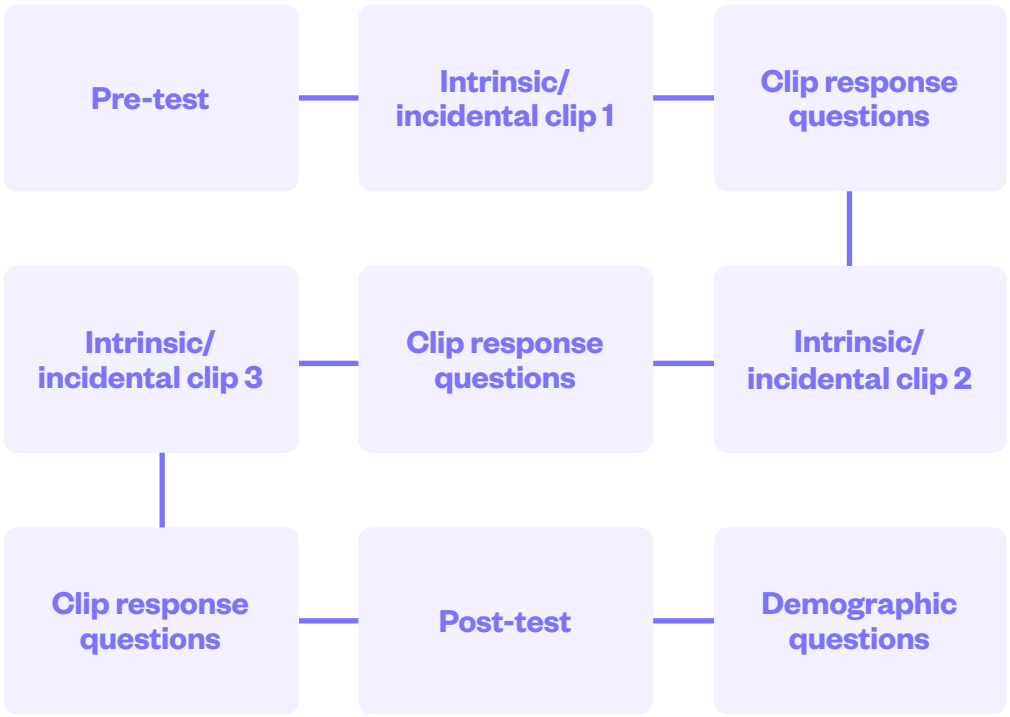
Figure 9: Political leaning breakdown of phase 2 participants

12 Appendix C:

Phase 3 methodology

Experimental design

640 participants were randomly divided into either the intrinsic climate content or incidental climate content at the start of the process. They viewed three short clips followed by answering key response indicators. A flow diagram illustrating the experimental process can be found below:



12.1 Question structure

Pre-test/ post-test	Dependent variables	Question	Answer options
Pre-test/ post-test	Pro-environmental behaviour	How often do you carry out the following actions? (Not all will necessarily be possible for you, or you may not want to do them) Options: 1-5 Likert scale (never to always)	• Drive distances of a mile or less • Eat meat or fish • Turn off appliances when not in use • Consider environmental credentials for new purchases (e.g. energy rating, sustainable materials, distance travelled) • Go on more than one return flight a year • Have more than one meat-free day per week • Talk about climate change to friends and family
Pre-test/ post-test	Global issues concern / climate concern	How concerned are you about the following issues? Options: 1-5 Likert scale (very unconcerned to very concerned)	• Social issues and inequality • Health and wellbeing issues • Extreme weather events • Land, food and water challenges • Biodiversity and nature • Politics • Economics • Climate change
Pre-test/ post-test	Social norm measure[14]	Please select which option you most agree with:	1. I am obliged to contribute my part to climate change mitigation 2. I have a responsibility to do what I can to prevent climate change 3. Taking action against climate change is the morally right thing to do
Post-test only	Technical issues	Did you have any technical issues playing the videos (yes, no, N/A)	1. Video was unable to play 2. The sound quality was poor 3. The video quality was poor 4. The video had trouble loading/ kept pausing

10.3.1

Condition	Clip	Clip response questions	
		Quantitative	Qualitative questions

Implicit (resource use)	Drama series; mention of a circular economy service	1. **Have you seen this episode before?** Yes / No / Not sure
		2. **Emotional response scale**[25]
		• Did you find the clip: (1-5 Likert scale; strongly disagree to strongly agree)
		  • enjoyable/not enjoyable
		  • entertaining/not entertaining
		  • interesting/not interesting
		  • likeable/not likeable
		3. **Plot connectedness** (adapted from Russell et al., 2009)[24]
		• Please answer on a scale of 1-5 (strongly disagree to strongly agree) whether:
		  • climate change references are relevant to the story
		  • without references to climate change, the story would be different
		  • climate change is connected to the plot
			1. What messages are you taking away from the clip?
			2. Did you identify any environmental or sustainability themes in the clip?

Implicit (travel)	Entertainment travel show; implied benefits of low-carbon transport options		
Implicit (systemic)	Drama series; mention of voting intention for environmental reasons		
Explicit (resource use)	Light entertainment; discussion of upcycling and waste		
Explicit (travel)	Entertainment travel show; discussion of low-carbon transport options and climate impacts		
Explicit (systemic)	Drama series; discussion of donation to environmental causes		

Table 2: Experimental framework for Phase 3