

CLIMATE REALITY ON-SCREEN: THE CLIMATE CRISIS IN POPULAR FILMS, 2013-22

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EXECUTIVE SUMMARY

In July 2023, as the world experienced its hottest day, week, month, and year in recorded history, UN Secretary-General António Guterres declared that “the era of global warming has ended” and “the era of global boiling has arrived.”¹ The world is not acting quickly enough to respond to the pace of climate change. As NASA climate scientist Peter Kalmus observed, “we are losing Earth on our watch.”²

We are living through a crisis that touches every aspect of our lives, and therefore has a place in every contemporary story. Today, films set in the present or near future that do not include climate change can be considered what they are: fantasy. But there are too few studies examining whether popular films reflect our climate reality. This gap in knowledge prevents us from understanding climate visibility and representation in popular entertainment, as well as the related challenges and opportunities.

The Climate Reality Check, a Bechdel-Wallace Test for a World on Fire, provides audience members, screenwriters, filmmakers, studios, and researchers with a straightforward way to evaluate whether climate change is represented—or omitted—in any narrative.³ This two-part, binary evaluation tool is simple, illuminating, and powerful.

**It asks whether, in
a given story:**

1

CLIMATE CHANGE EXISTS

AND

2

A CHARACTER KNOWS IT



To apply the Climate Reality Check and examine climate change in contemporary films, we conducted a systematic content analysis of 250 of the most popular fictional films released between 2013 and 2022. (Since the Climate Reality Check is intended to check whether films are reflecting the reality of climate change, we excluded films that are high fantasy, not set on Earth, set before 2006, or set after 2100.)

We found that climate change was rarely present.

- Only 9.6% of the 250 films passed the Climate Reality Check.
- Climate change existed in the story world of only 12.8% of all films (passing part one of the test).
- Climate change was mentioned in two or more scenes in only 3.6% of all films.

However, climate inclusion is becoming more common.

- Climate change was present in twice as many films released during the second half of the decade we examined (2018 to 2022) compared to the first half (2013 to 2017).

We also found that stories that include climate change are profitable.

- Among the 220 films with theatrical releases, films that included climate change (passing part one of the test) earned, on average, 8% more at the box office than those that did not.
- Similarly, films that included at least one character who is aware of climate change (passing part two of the test) performed 10% better at the box office than those that did not.



Results for the first part of the Climate Reality Check—“climate change exists”—varied widely across major studios.

- Streamers had the highest percentage of films that include climate change (25%), almost double the rate of the Big Five studios (12.7%).
- Among the Big Five, nearly a quarter (23.3%) of Warner Bros.’ films included climate change. Sony (6.9%) and Paramount (4.8%) came in last.
- Climate change was included in 38.5% of DC Comics films, compared to 8.3% of Marvel movies.

Testing the second part of the Climate Reality Check revealed that the demographics of characters who are aware of climate change on-screen do not accurately reflect our climate reality.

- Only one in ten films (9.6%) included a character who is aware of climate change.
- Characters who were portrayed as being aware of climate change were overwhelmingly male (69.5%), white (65%), and middle-aged (77.2%), which is not an accurate depiction of those who are most affected by and most concerned about climate change in the real world.
- Only 2% of films contained a character who is experiencing climate anxiety.
- Climate-friendly actions were rarely depicted: only 9.6% of films portrayed a character riding a bicycle, and 1.2% of films featured characters who are identified as vegan or vegetarian.

Our results paint a clear picture: including climate change in films is profitable, and it’s on the rise.

At this inflection point in the crisis, there is an unprecedented opportunity for Hollywood to help us navigate what it means to be human in the age of climate change, by creating authentic stories that reflect the reality we’re all living in.

Climate change is the biggest story of our time, and the stage is set for Hollywood to accept its greatest role.



INTRODUCTION

While many steps toward slowing the climate crisis have been taken over the last decade, they have been woefully insufficient.

The most important global action was the 2015 Paris Agreement, a legally binding accord signed by 195 countries. The agreement is a pledge to limit warming to 1.5°C so as to minimize the intensity and frequency of extreme events affecting natural and human systems, as well as the chances of crossing tipping points that would lead to runaway environmental collapse.⁴ But the period following the Paris Agreement did not produce the necessary changes. In fact, global carbon dioxide emissions grew by 5% between 2016 and 2022.⁵ To fulfill the Paris Agreement, global emissions would need to decrease by 45% by 2030, and net zero—the point at which the amount of carbon added to the atmosphere is no more than the amount removed—would need to be achieved by 2050.⁶

If this does not happen, the consequences are expected to be irreversible and catastrophic.⁷

Just how catastrophic is becoming increasingly clear. The climate crisis is no longer a distant projection but a reality. This became especially apparent in 2023, as climate disasters swept the planet and dominated the headlines. In June, wildfires in Ottawa scorched 45 million acres of land, producing enough smoke to turn skies an ominous orange throughout the northeastern US.⁸ In July, catastrophic flooding hit Vermont⁹ and ocean temperatures reached disturbing record highs, including a temperature of 101°F off the Florida Keys.¹⁰ In August, a wildfire in Hawai'i, fueled by winds from a Category 4 storm, became the deadliest blaze in the US in more than a century.¹¹ The situation beyond the US has been just as devastating, if not more so.¹²

No place on Earth is safe. As one journalist summarized, “It’s as if every alarm bell on Earth were ringing.”¹³

“The climate crisis is no longer a distant projection, but a reality.”

“As one journalist summarized, ‘It’s as if every alarm bell on Earth were ringing.’”



The climate crisis is far more than an environmental issue: it is a through line in all social justice issues. It's a gender issue, with women and children far more likely to be displaced by or die in ecological disasters than men.¹⁴ It's an LGBTQ+ issue, with LGBTQ+ people suffering more during and after climate disasters.¹⁵ It's a disability issue, with disabled people two to four times more likely to be injured or die during disasters.¹⁶ It's a racial justice issue, with Black, Latinx, and Indigenous people more likely to die from climate impacts and to suffer first and worst from health and economic consequences.¹⁷ It's an economic justice issue, since the poorest countries are the most vulnerable to the effects of climate change.¹⁸ And it's a global justice issue, since the parts of the world that will be most affected are "racial and ethnic sacrifice zones" inhabited by the victims of colonial domination and neocolonial policies.¹⁹

Screening a world on fire

There are endless stories to tell in relation to the climate crisis. Climate change touches every aspect of our lives, if unevenly, so it is natural for it to appear in our stories.

Those stories matter. Entertainment media fundamentally shapes how we think, feel, act, and relate to each other and the world around us.²⁰ It does so partially by highlighting and focusing attention on specific issues. Cumulative exposure to commonly depicted stories, settings, and actions inevitably shapes viewers' attitudes, priorities, beliefs, and behavior. Consider crime. A classic study found that half of American television characters are involved in some kind of violent action each week; in real life, fewer than 1% of people in the US are victims of criminal violence in a given year.²¹ Heavy exposure to television leads to exaggerated perceptions of the number of people involved in violence, as well as other inaccurate beliefs about crime and law enforcement,²² which can inform the prioritization of "law and order" as a political issue and support for "tough on crime" policies.²³

The same goes for climate change: the more viewers see it included or highlighted in the narratives they are exposed to, the more likely they are to prioritize it as a public issue that demands attention and action.²⁴

And in an era in which public spaces are disappearing and news and information feeds are fragmented and polarized,²⁵ entertainment media retain the ability to reach and influence audiences across ideological divides. Contemporary media ecologies contain a wide variety of choices, and audiences with consistent political beliefs tend to choose news sources whose reporting biases align with their own values.²⁶ As a result, some people rarely receive information about the scale and gravity of the climate crisis. Indeed, a recent survey found that only 52% of Americans hear about climate change in the media once a month or more, 38% hear about it only once a year, and 9% never hear about it at all.²⁷

"The climate crisis is far more than an environmental issue: it is a through line in all social justice issues."

"The more viewers see it included or highlighted in the narratives they are exposed to, the more likely they are to prioritize it as a public issue that demands attention and action."

Many viewers would welcome more climate representation in entertainment media. Nearly three quarters of Americans are “alarmed,” “concerned,” or “cautious” about climate change,²⁸ and 48% of them want to see more fictional TV shows and films with themes related to the climate crisis, with another 30% “neutral” about the proposition. Only 23% are “not at all” or “very little” interested.²⁹

There is a significant body of research on how entertainment media influence viewers’ attitudes, beliefs, and behaviors in relation to climate change. However, most of this research has focused on the short-term impact of watching a single climate-focused film such as *The Day After Tomorrow* or *The Age of Stupid*.³⁰ While the effects from exposure to a single film tend to be small and short-lived, multiple similar or complementary messages can have a compounding effect, and are more likely to last over time.³¹ But there has been almost no research that has systematically examined whether popular films include the climate crisis at all—a necessary step in informing or reminding audiences of its gravity and urgency.³² Without this information, studios, filmmakers, and researchers lack objective data about how the film industry is responding to the climate crisis, and how it can do more.

48%

of Americans want to see more fictional TV shows and films with themes related to the climate crisis.



“There has been almost no research that has systematically examined whether popular films include the climate crisis at all—a necessary step in informing or reminding audiences of its gravity and urgency.”

THE CLIMATE REALITY CHECK

To provide studios, screenwriters, filmmakers, audiences, and researchers with a straightforward way to assess any narrative for climate representation, researcher Matthew Schneider-Mayerson partnered with Anna Jane Joyner, Carmiel Banasky, and Bruno Olmedo Quiroga from Good Energy³³ to develop the Climate Reality Check, a Bechdel–Wallace Test for a world on fire.³⁴ This two-part binary evaluation tool is simple, illuminating, and powerful. It asks whether, in a given story:

- 1 *Climate change exists*
- 2 *And a character knows it*

The Climate Reality Check is a minimalist test. It does not require that every story center climate change, nor does it prescribe the kinds of stories filmmakers should tell.

Climate change is a part of everyone's lives in every part of the globe. It follows that it would be a part of life for all characters and in all settings in contemporary stories. This test is a simple way to measure its occurrence.



Why these conditions were chosen

These specific conditions were chosen after extensive testing and consultation with writers, filmmakers, and communication experts, and informed by research on the effects of media.

1 “CLIMATE CHANGE EXISTS”

was selected because the Climate Reality Check is, first and foremost, a “reality check” for narratives—a “reminder of the situation or state of things in the real world.”³⁵ This first component of the Climate Reality Check measures contemporary narratives to see whether they reflect the world as it is. When stories erase climate change, they seem increasingly out of touch with reality.³⁶ The more that stories include climate, the more authentic and relevant they are, allowing them to connect with audiences and their experience of being alive in the age of climate change.

IMPACT

Research suggests that viewers who see climate change included in films are more likely to prioritize it as an issue that demands attention and action in real life, helping audiences and society at large respond to the climate crisis.³⁷

2 “A CHARACTER KNOWS IT”

was selected primarily because we are all impacted by, and emotionally responding to, climate change, so the characters in the stories we watch and love would be too. Around the world, 93% of people agree that climate change poses a serious and imminent threat to the planet.³⁸ Worldwide searches related to “climate anxiety” increased by 4,590% between 2018 and 2023.³⁹ And 75% of young people (aged 16–25) in ten diverse countries report finding the future frightening because of climate change.⁴⁰

Yet the crisis is still discussed remarkably infrequently: the Yale Program on Climate Change Communication found that, despite the vast majority of Americans being concerned, only 37% talk about climate change with family or friends.⁴¹ This social norm makes it hard to start a conversation, and it leads people to underestimate how concerned others are about climate change.⁴² This “spiral of silence” can contribute even further to climate anxiety and hopelessness, and hence inaction.⁴³ And that’s no accident: it’s a fossil fuel industry–led media strategy to sow denial, inaction, and doomism.⁴⁴ Audiences want on-screen stories that reflect themselves and their reality, but report that they aren’t seeing characters who share their level of concern about climate change.⁴⁵ This component of the test directly addresses that gap.

IMPACT

A character talking about climate change can help model conversations about it in real life,⁴⁶ and simple conversations about climate change can be remarkably influential. As climate scientist Dr. Katharine Hayhoe says, the most important thing a person can do to fight climate change is talk about it.⁴⁷



METHODOLOGY

To apply the Climate Reality Check and examine the representation of climate change in contemporary films more broadly, we conducted a systematic content analysis of 250 of the most popular fictional films released between 2013 and 2022. Due to the advent and popularity of straight-to-streaming releases, box office earnings are not always the most accurate or appropriate way to determine popularity. Instead, we used the total number of ratings on the website IMDb as a proxy for popularity.⁴⁸ We started with the 25 most-rated films for each year, and selected the next most-rated films as needed to replace films that did not meet our inclusion criteria.⁴⁹ Since the Climate Reality Check is intended to check whether films are reflecting the reality of anthropogenic climate change, the films we excluded from our data set were films that are high fantasy,⁵⁰ not set on Earth, and/or set primarily before 2006 or after 2100. We also excluded documentaries, since this analysis is focused on works of fiction.



In consultation with Good Energy, we applied the Climate Reality Check in the following manner.

For part one, “Climate change exists,” we applied these rules:

- Any mention of terms such as “climate change,” “a changing climate,” “the climate crisis,” “global warming,” “a warming world,” “melting glaciers,” or “rising seas” demonstrates that climate change is occurring in the story world, and counts as passing part one.
- Bad weather alone does not count, but bad weather that is described using terms such as “unprecedented” or “occurring with greater frequency” does.
- Other impacts, such as decreased agricultural production or increased migration, can also count—but only if the link to climate change is made clear through dialogue or other means.
- Descriptions of events or processes that are extremely likely to be due in part to climate change (such as the collapse of ecosystems in the near future) do count.
- However, descriptions that are so vague that they may or may not be referencing climate change (such as the need to “save the planet” without any further explanation or context) do not count.
- The presence of climate change in a story world can also be demonstrated through responses to climate change, such as a character who is engaged in a climate-positive behavior—as long as that behavior is explicitly connected to climate change.

For part two, “A character knows it,” we applied these rules:

- Awareness of climate change can be demonstrated in a number of ways. For example, a character might:
 - Mention climate change in dialogue.
 - Watch a news report, read a newspaper article or book, or point out a piece of graffiti or art that’s clearly about climate change.
 - Participate in an action that is specifically in response to climate change, such as a climate protest, after-school club, or public hearing.
 - Be clearly identified in a professional or personal role that requires awareness of and is associated with climate change, such as climate scientist or climate activist.
- Even in a film set in an apocalyptic future, awareness is not assumed—it must be demonstrated.



Research questions

We examined the following questions:

- 1** How often does climate change exist in the most popular fictional films released in the last decade?

- 2** How often are some of the impacts of climate change—such as severe storms, flooding, extreme heat, and drought—depicted or mentioned, whether or not they’re not connected to climate change?

- 3** How often are characters depicted as being aware of climate change?

- 4** How do different factors—such as the year of a film’s release, temporal setting, genre, box office performance, and distributor—affect the presence or absence of climate change and climate awareness in a film?

- 5** What is the demographic profile of climate-aware characters?

- 6** Whether climate change is present or not, how often are simple and effective climate-positive actions, such as riding a bike or being vegan or vegetarian, depicted or mentioned?



RESULTS

FIGURE 1 OVERALL PERFORMANCE ON THE CLIMATE REALITY CHECK

Only 9.6% of the 250 films passed the Climate Reality Check.

A further 3.2% of the films analyzed passed partially (climate change exists, but no character knows it). The remaining 87.2% did not pass either component of the Climate Reality Check (climate change does not exist, and no character knows it).

87.2%

did not pass the Climate Reality Check

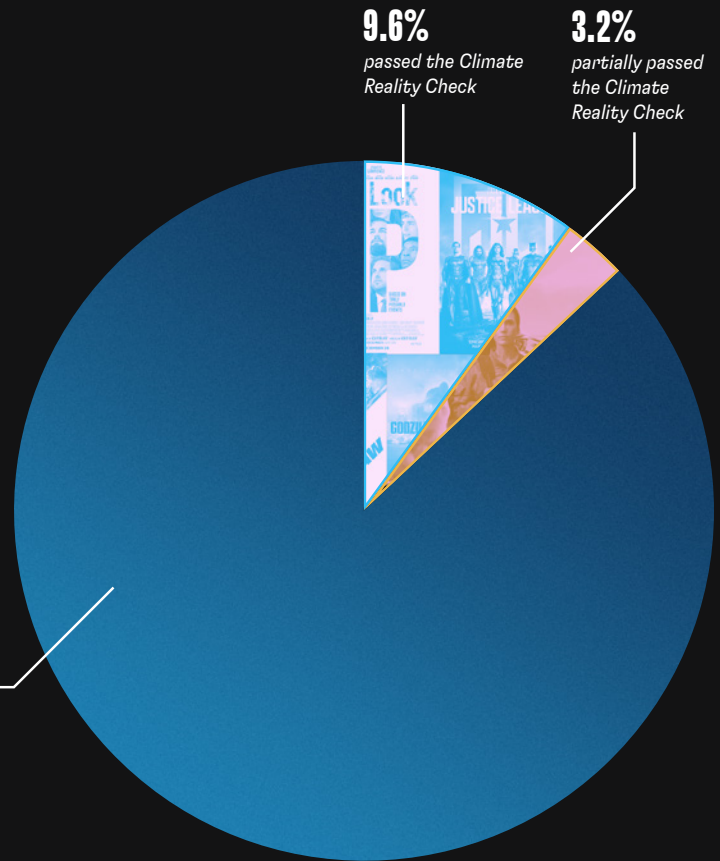
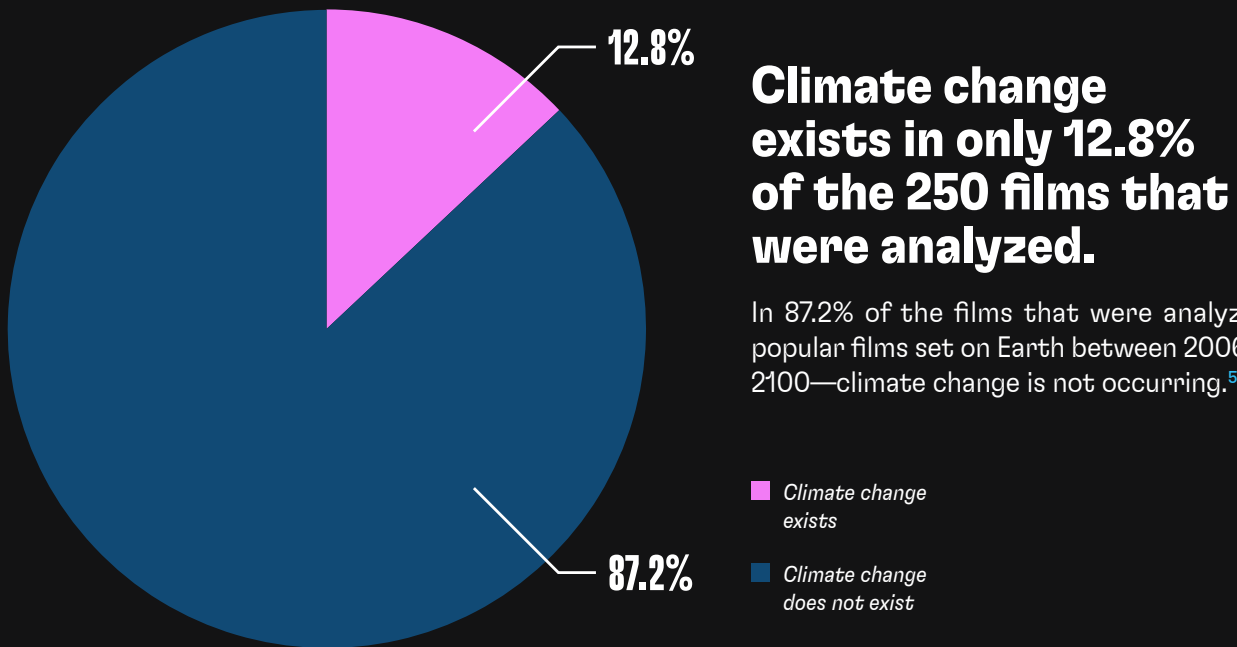


FIGURE 2 PART 1: THE EXISTENCE OF CLIMATE CHANGE

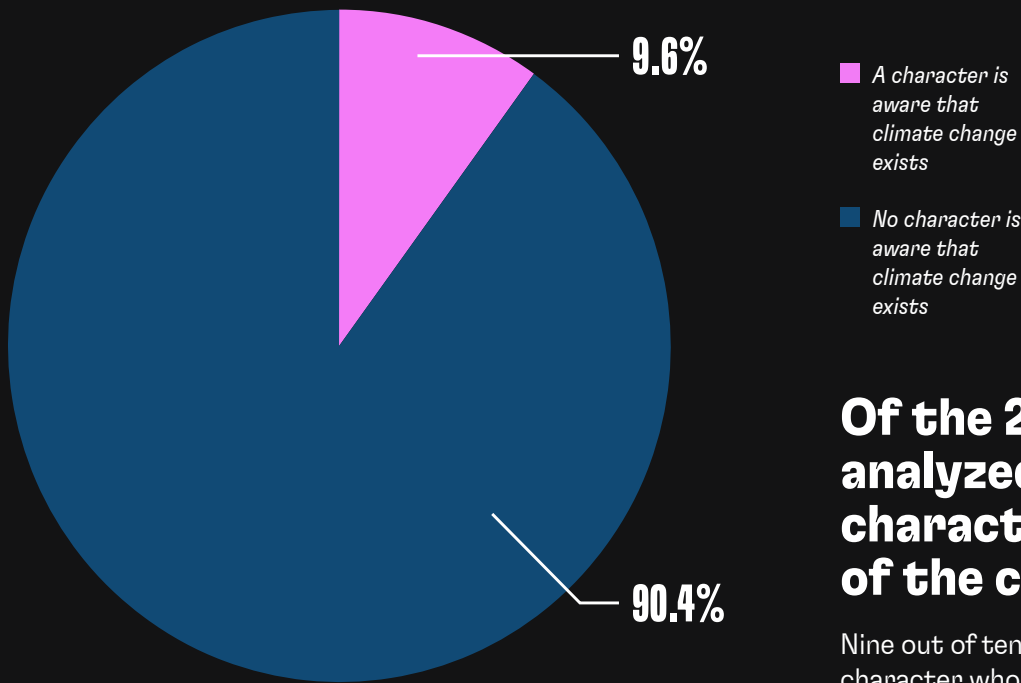


In these 250 films, when climate change does appear, it's often in dialogue. For example, in *Justice League* (2017), as Batman struggles to recruit Aquaman to rejoin the Justice League, he asks, "What is it? Mankind's melting the polar ice caps, destroying the ecosystem. They had it coming?" Aquaman responds by saying, "I don't mind if the oceans rise." Though it's a passing mention in a single scene, the film clearly and succinctly introduces climate change—and connects it to catastrophic impacts.

Elsewhere, films referred to climate change through visual references. For example, before a fashion show begins in *Triangle of Sadness* (2022), the giant LED screen above the stage reads, "THERE IS A NEW CLIMATE ENTERING THE WORLD." After a beat, the sentence is completed: "OF FASHION." This is a clever climate mention that highlights the way the fashion world, satirized throughout the film, tends to ignore serious issues such as the climate crisis.



FIGURE 3 PART 2: CHARACTER AWARENESS OF CLIMATE CHANGE



Of the 250 films analyzed, 9.6% include a character who is aware of the climate crisis.

Nine out of ten films do not include a single character who is aware of climate change.

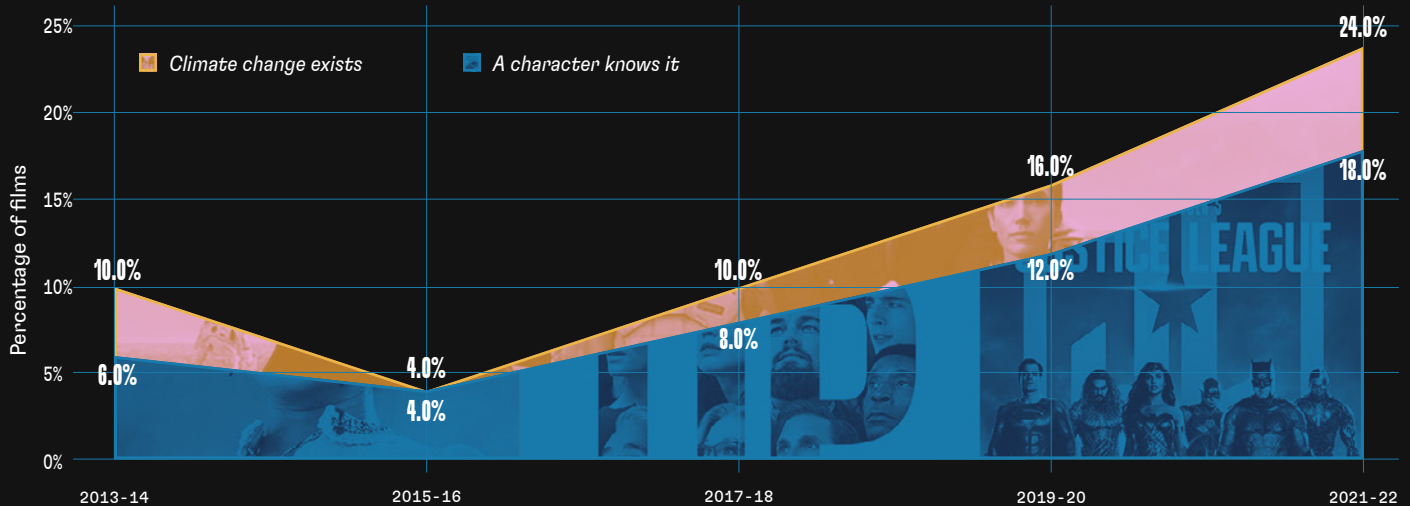
TABLE 1 FILMS IN THIS SAMPLE THAT PASSED THE CLIMATE REALITY CHECK, BY YEAR:

2013	<i>Pacific Rim</i>	2020	<i>Tenet</i> <i>The Hunt</i>
2014	<i>Kingsman: The Secret Service</i> <i>The Amazing Spider-Man 2</i>	2021	<i>Don't Look Up</i> <i>Zack Snyder's Justice League</i> <i>Eternals</i> <i>Godzilla vs. Kong</i> <i>The Tomorrow War</i> <i>Wrath of Man</i>
2015	<i>Maze Runner: The Scorch Trials</i> <i>Fantastic Four</i>	2022	<i>Glass Onion</i> <i>Jurassic World Dominion</i> <i>Triangle of Sadness</i>
2016			
2017	<i>Justice League</i> <i>Happy Death Day</i>		
2018	<i>Venom</i> <i>Aquaman</i>		
2019	<i>Midsommar</i> <i>Marriage Story</i> <i>Fast & Furious Presents: Hobbs & Shaw</i> <i>Pokémon: Detective Pikachu</i>		

To see the complete list of films, see [Appendix C](#).

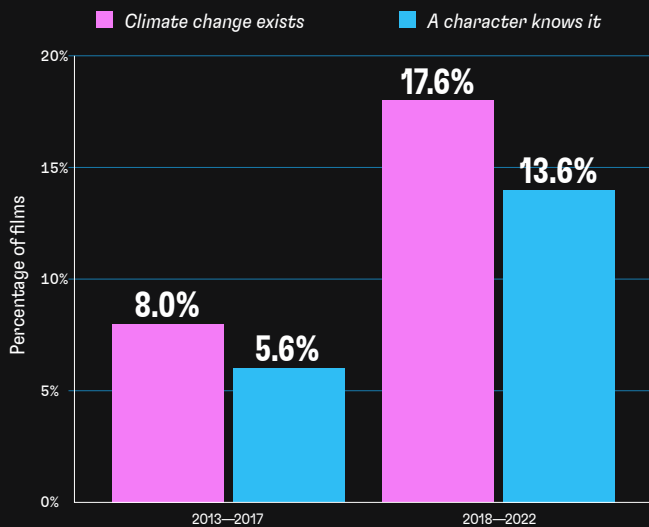
CHANGE OVER TIME

FIGURE 4 PERFORMANCE ON THE CLIMATE REALITY CHECK OVER TIME



The representation of climate change in popular films grew over time, increasing gradually from 2015-16 to 2021-22.

FIGURE 5 PERFORMANCE ON THE CLIMATE REALITY CHECK BY FIVE-YEAR INTERVALS

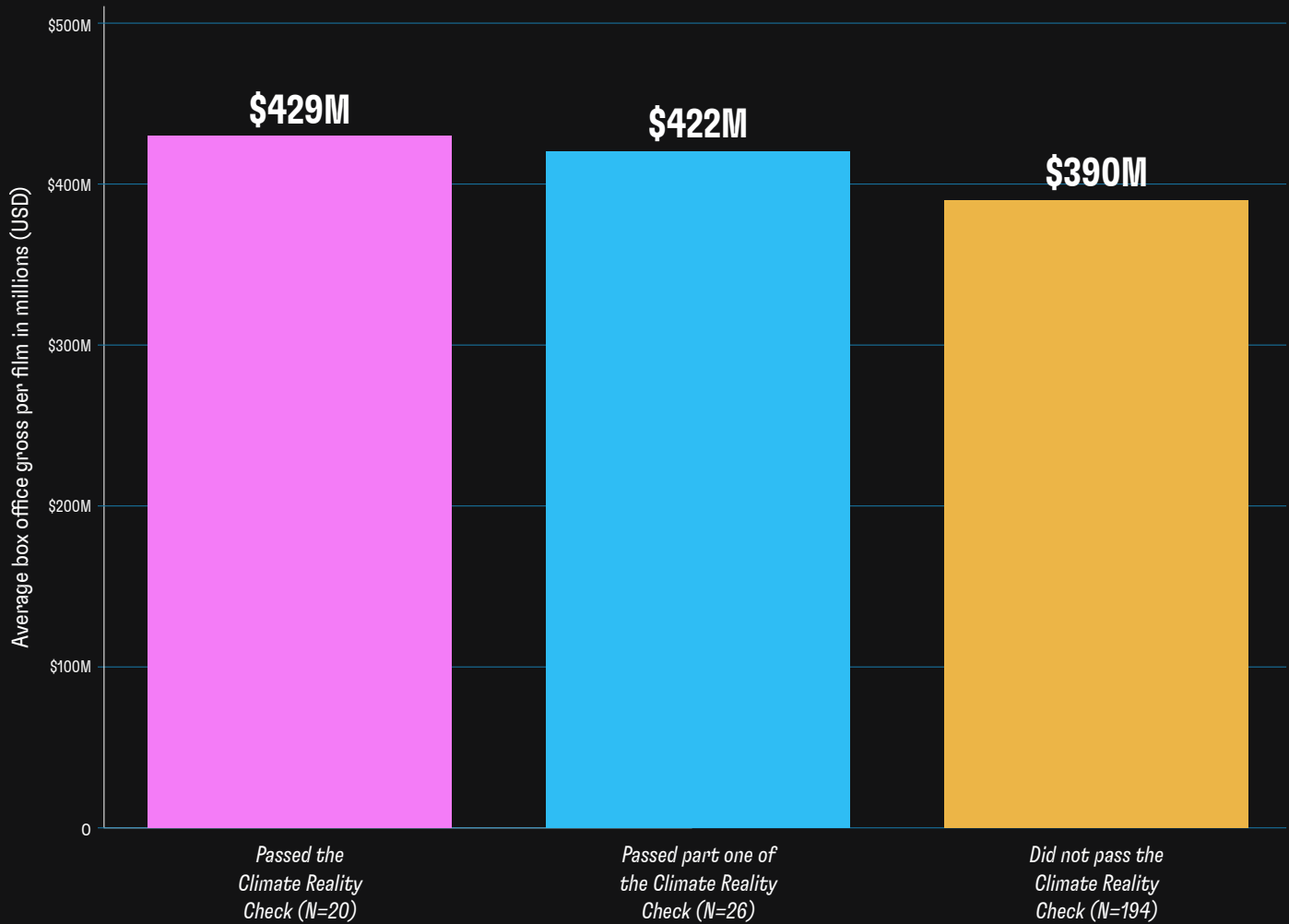


The rate of inclusion of climate change in popular films more than doubled from the first half of the decade (2013-17) to the second (2018-22).

This is a positive development, showing that filmmakers are increasingly responding to the dramatic changes occurring around us. However, **greater representation is needed**. Even with this increase, climate change was present in less than one out of every five films released between 2018 and 2022.

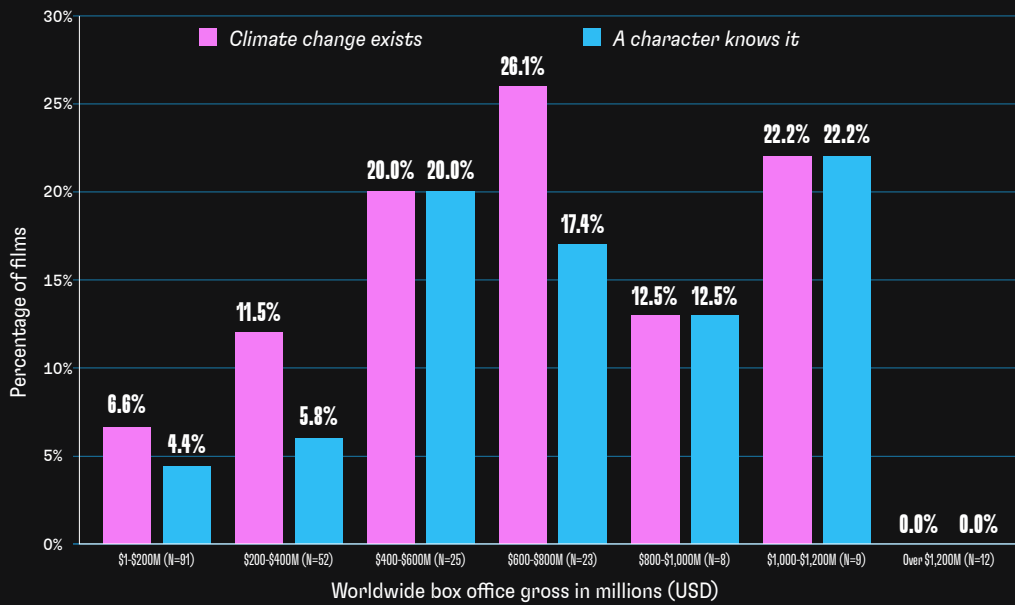
BOX OFFICE PERFORMANCE

FIGURE 6 BOX OFFICE EARNINGS BY PERFORMANCE ON THE CLIMATE REALITY CHECK



Films that passed the Climate Reality Check had higher box office earnings than those that didn't.

FIGURE 7 PERFORMANCE ON THE CLIMATE REALITY CHECK BY BOX OFFICE EARNINGS



Films including climate-change earned

8% more

than those that didn't.

Films with climate-aware characters performed

10% better

than those with none.

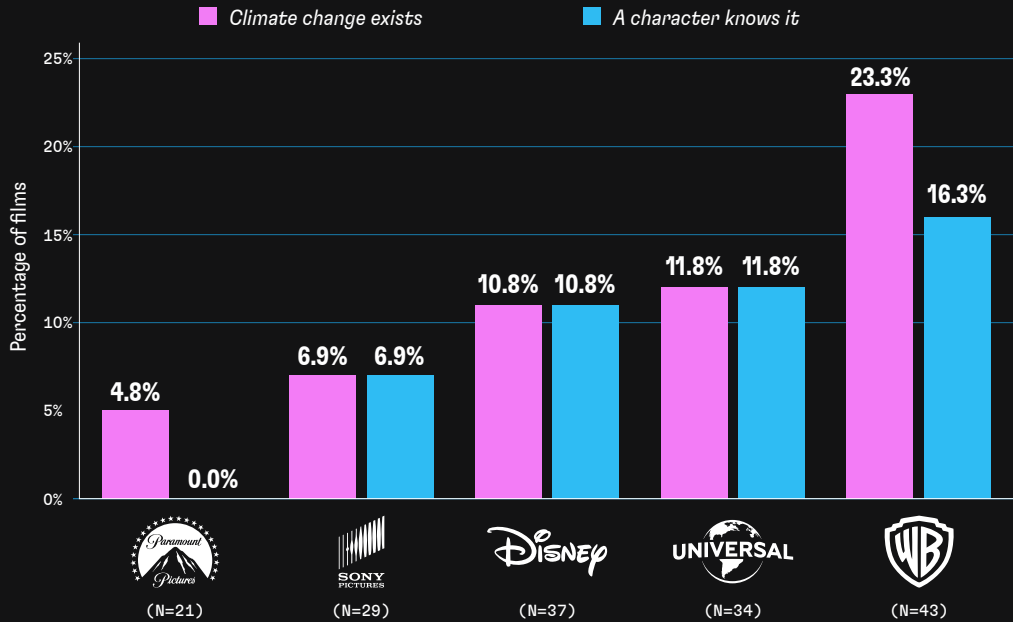
Among the 220 films with theatrical releases, **films that included climate change earned, on average, 8% more at the box office than films that did not include climate change.** This was not merely the result of a small sample size—further analysis indicated a positive association between box office gross and the inclusion of climate change.⁵²

Similarly, among the 220 films with theatrical releases, **films that included at least one character who is aware of climate change performed 10% better at the box office** than films that did not. Here too, further analysis indicated a positive association between box office gross and the inclusion of a climate-aware character.⁵³



DISTRIBUTORS

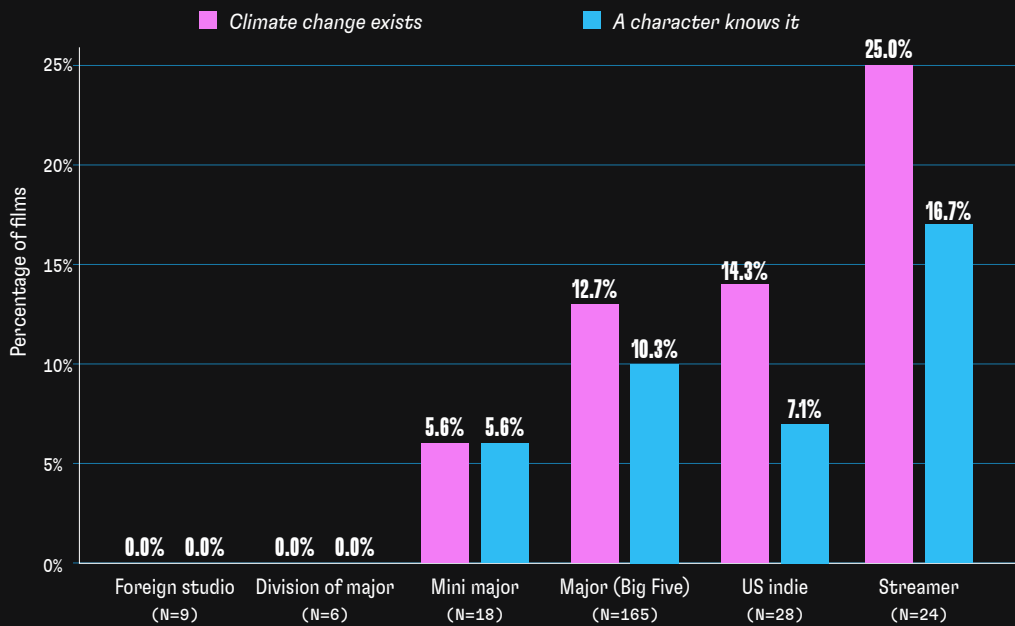
FIGURE 8 PERFORMANCE ON THE CLIMATE REALITY CHECK BY MAJOR FILM DISTRIBUTORS



The five major Hollywood studios varied widely in their performance on the Climate Reality Check. **Warner Bros. was far ahead of its competitors, with nearly a quarter of its films including climate change. Sony and Paramount came in last.** None of Paramount's 21 films contained a single character who is depicted as being aware of climate change.



FIGURE 9 PERFORMANCE ON THE CLIMATE REALITY CHECK BY TYPE OF DISTRIBUTOR

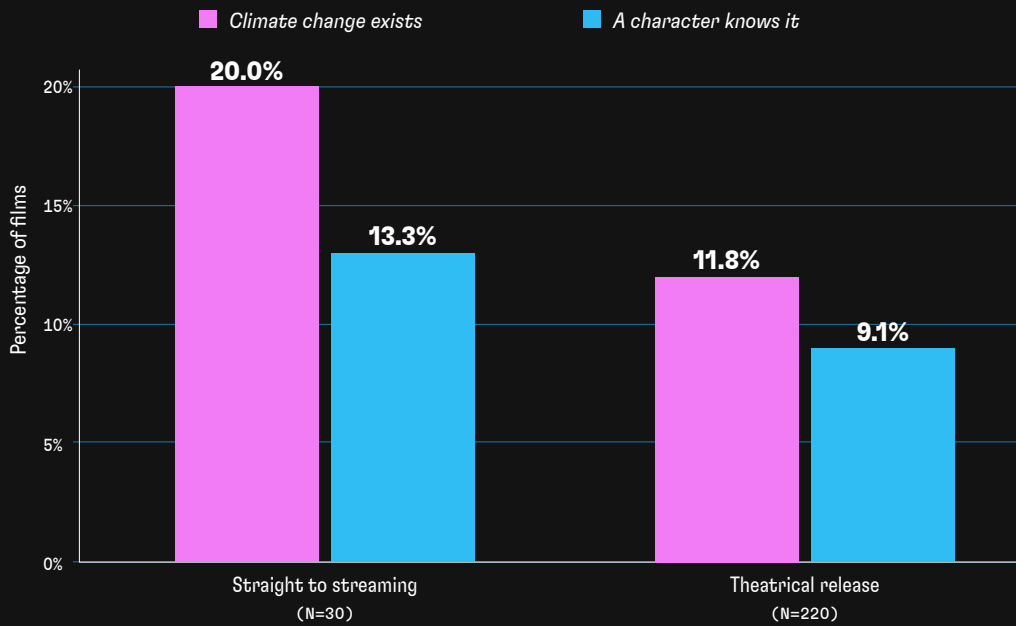


When the distributors of the 250 films are grouped into six categories—majors (Big Five), divisions of majors, mini majors, US-based indies, foreign studios, and streamers—clear differences emerge. **The streamers (Netflix, Amazon Studios, and Apple TV+) had the highest percentages of films that include climate change in their story worlds**, with a quarter of their films passing part one of the Climate Reality Check. Divisions of majors (Focus Features, Fox Searchlight/Searchlight Pictures, and Sony Pictures Classics) and foreign studios came in last, with none of their 15 combined films passing either part of the test.

The performance of the streamers was due in part to Netflix, which distributed the bulk of the films in this category. Of the Netflix films in our sample, 20% included climate change, and 15% included a character who was aware of it.



FIGURE 10 PERFORMANCE ON THE CLIMATE REALITY CHECK BY TYPE OF RELEASE

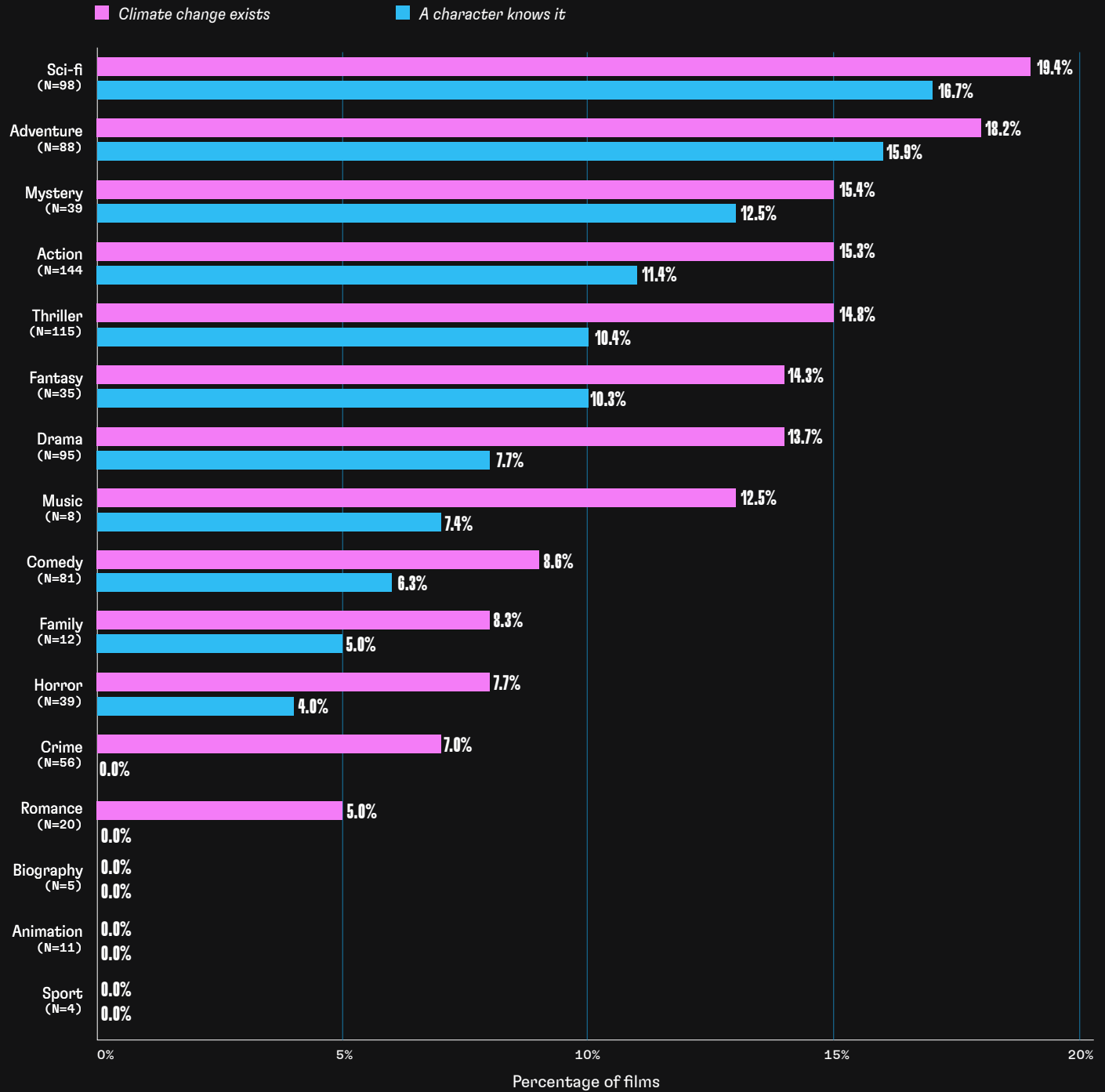


Given that the streamers did better than the majors, it's not surprising that straight-to-streaming releases performed better than those with theatrical releases. In this sample, **straight-to-streaming films were nearly twice as likely to include climate change in their story worlds, and more likely to include climate-aware characters, than films that were released to theaters.**⁵⁴



GENRE

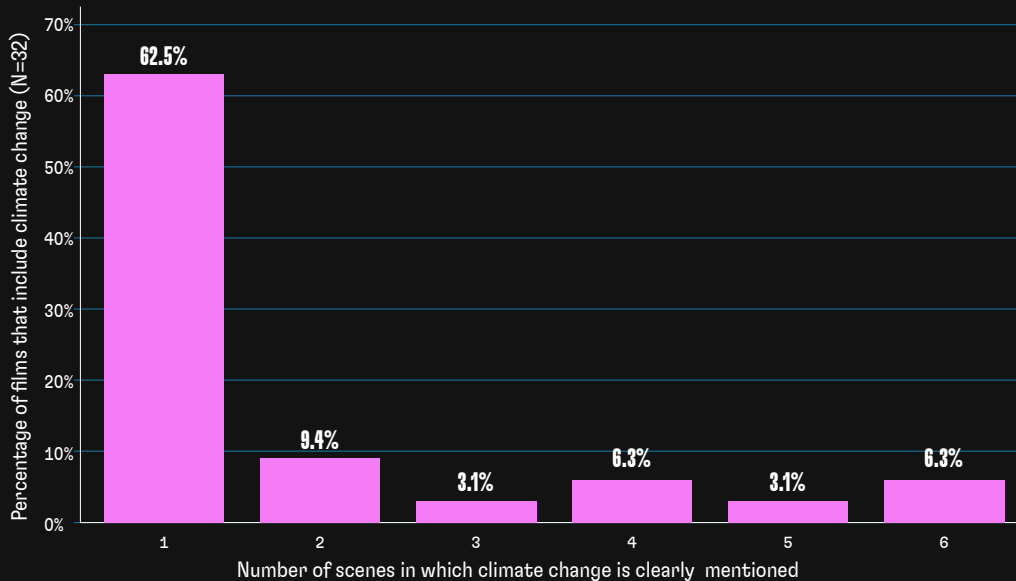
FIGURE 11 PERFORMANCE ON THE CLIMATE REALITY CHECK BY GENRE



Our sample of 250 films contained 16 genres, as defined by IMDb. **Films labeled sci-fi, adventure, mystery, and action were most likely to include climate change in their story worlds.** Films labeled as biography, animation, sport, and romance were the least likely.

LEVELS OF CLIMATE PRESENCE

FIGURE 12 THE NUMBER OF SCENES IN WHICH CLIMATE CHANGE IS CLEARLY MENTIONED IN FILMS THAT INCLUDE CLIMATE CHANGE



Of the 32 films that included climate change, 62.5% clearly mentioned climate change in a single scene. This means that **just 3.6% of the total of 250 films mentioned climate change in two or more scenes.**⁵⁵

Some of the films that contained the most climate references were not necessarily focused on climate change. Instead, they found clever ways to include “climate mentions,” where “characters mention climate change in passing, which normalizes talking about the climate crisis in daily life.”⁵⁶ For example, in *Happy Death Day* (2017), a college student relives the same day repeatedly, encountering the same people each time. One of them is a climate activist who asks passersby if they would like to help “stop global warming.” Audiences are thereby reminded of the climate crisis repeatedly—a total of six times in the film.




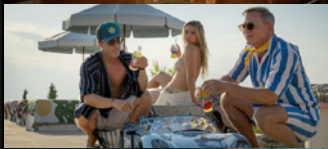

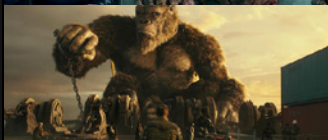
Other films wove climate change into the setting and backdrop. Within the first few minutes of *Blade Runner 2049* (2017), the film introduces climate change by mentioning the “ecosystem collapse” of the mid-2020s. The film is set in a world that is reliant on synthetic farming to avoid famine and barrier walls to keep rising oceans at bay. The air is polluted and people are lining up to join colonies in outer space. While climate change is never explicitly mentioned, it is part of the story world.

CLIMATE REALITY CHECK ALL-STARS

TABLE 2 DIRECTORS WITH TWO FILMS THAT PASSED AT LEAST ONE PART EACH

	Director	Movie #1	Movie #2
	Bong Joon Ho	<i>Parasite</i> (2019)	<i>Snowpiercer</i> (2013)
	Christopher Nolan	<i>Tenet</i> (2020)	<i>Interstellar</i> (2014)

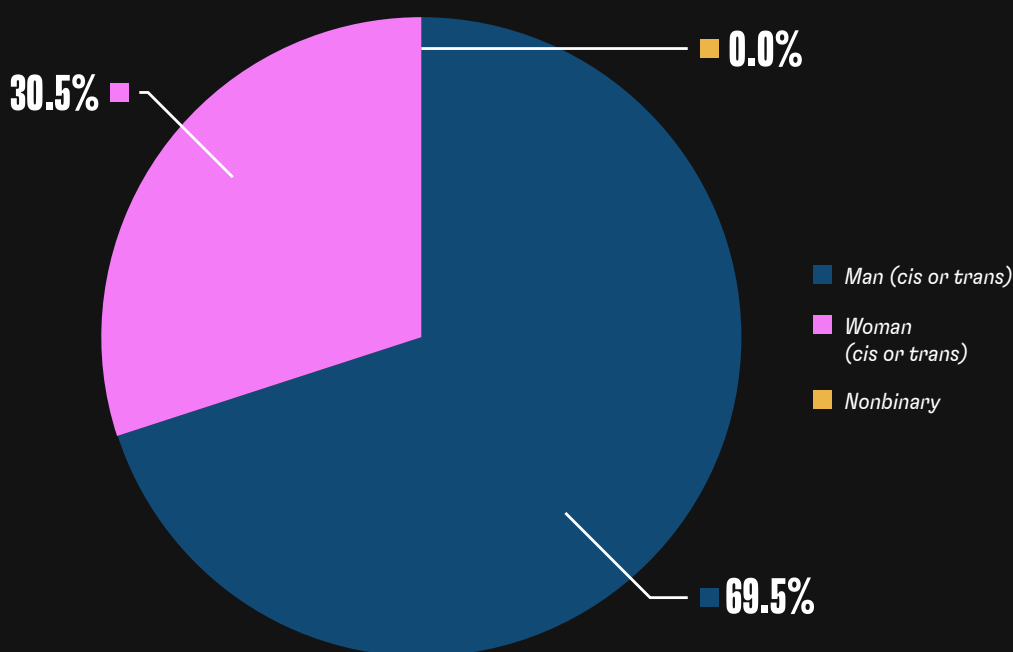
TABLE 3 DIRECTORS WITH FILMS THAT HAD THREE OR MORE CLIMATE MENTIONS

	Director	Movie	Number of Scenes
	Christopher Landon	<i>Happy Death Day</i> (2017)	6 scenes
	Wes Ball	<i>Maze Runner: The Scorch Trials</i> (2015)	6 scenes
	Matthew Vaughn	<i>Kingsman: The Secret Service</i> (2014)	5 scenes
	Rian Johnson	<i>Glass Onion</i> (2022)	4 scenes
	Josh Trank	<i>Fantastic Four</i> (2015)	4 scenes
	Adam Wingard	<i>Godzilla vs. Kong</i> (2021)	3 scenes

UNREALISTIC DEMOGRAPHICS OF CLIMATE-AWARE CHARACTERS

To see whether films are accurately depicting the people who are aware of, concerned about, and taking action in response to climate change, we coded the gender, race/ethnicity, and age of characters depicted as being aware of climate change.⁵⁷

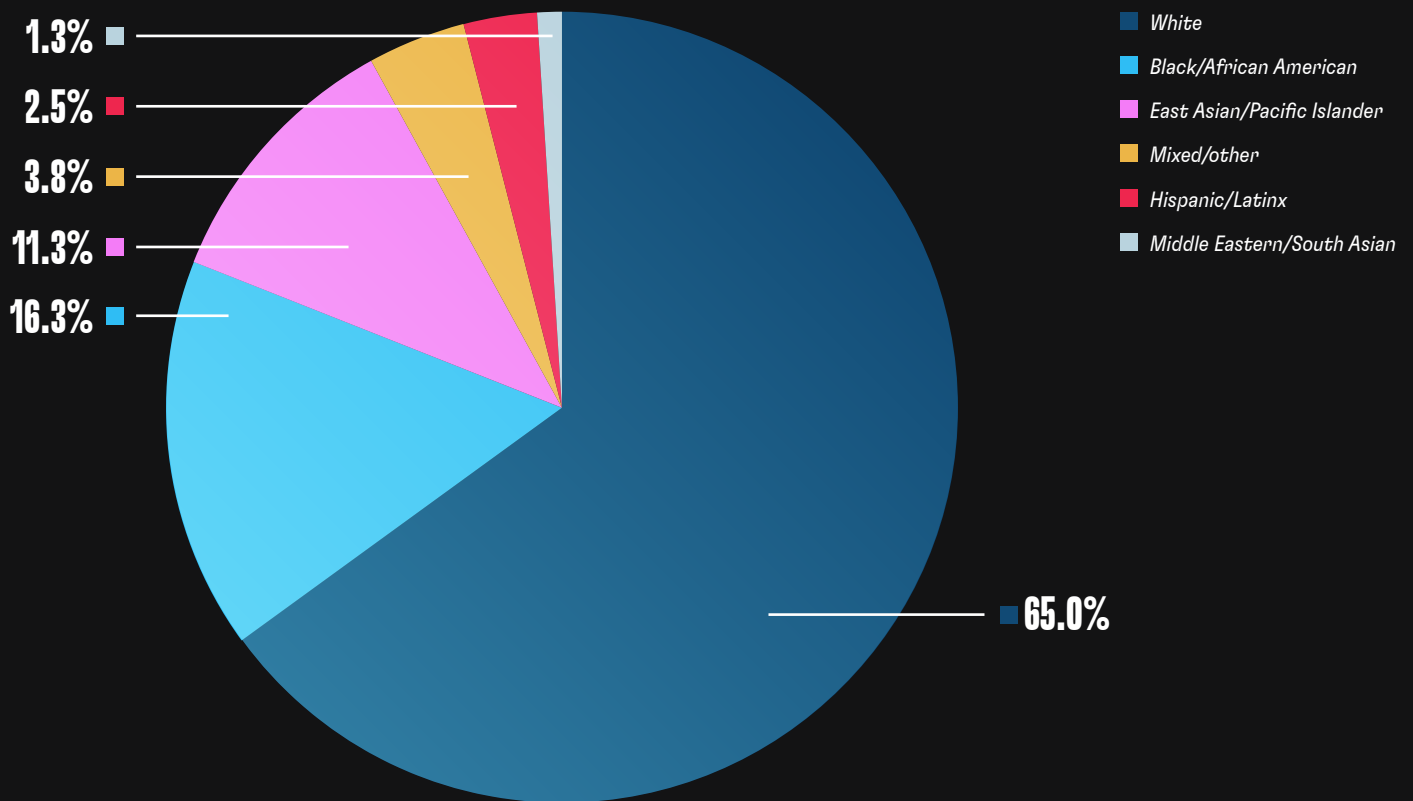
FIGURE 13 GENDER OF CHARACTERS WHO ARE AWARE OF CLIMATE CHANGE



Of the characters who were aware of climate change, 69.5% were male, 30.5% were female, and none were nonbinary.

This is an unrealistic representation of people who are aware of and having conversations about climate change, since film characters primarily register their awareness through dialogue. Research has found that women are more likely than men to be “alarmed” or “concerned” about climate change (at rates of 59% for women and 52% for men),⁵⁸ and are more likely than men to discuss climate change with their friends and family (39% versus 34%, respectively).⁵⁹

FIGURE 14 RACE/ETHNICITY OF CHARACTERS WHO ARE AWARE OF CLIMATE CHANGE

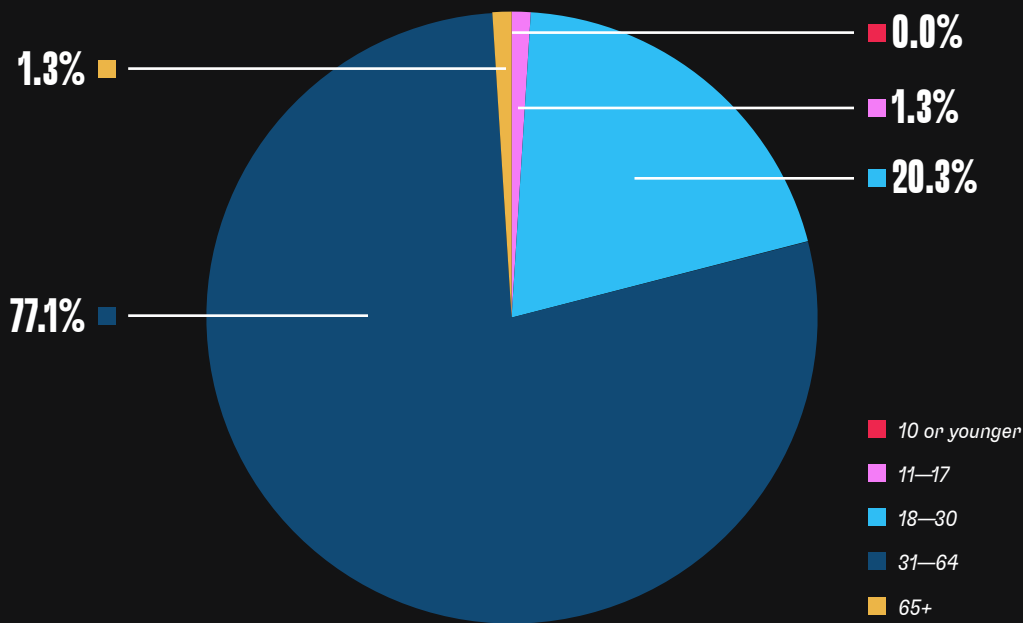


The majority of climate-aware characters were white (65%)—an inaccurate representation of real-world conversations about climate change.

Compared to Hispanic/Latinx Americans (64%) and Black/African Americans (61%), white Americans (50%) are the least likely to be “alarmed” or “concerned” about climate change.⁶⁰ White Americans are also less likely than Hispanic/Latinx Americans to discuss the climate crisis with their friends and family (at rates of 35% and 41%, respectively).⁶¹



FIGURE 15 AGE OF CHARACTERS WHO ARE AWARE OF CLIMATE CHANGE



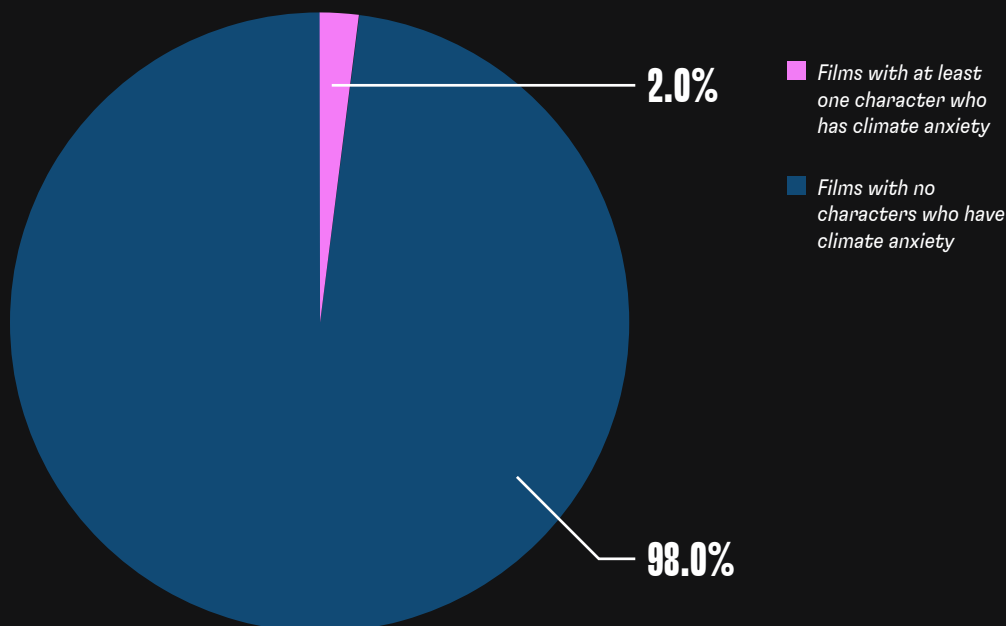
The vast majority (77.1%) of climate-aware characters were between 31 and 64 years old.

This too is an unrealistic representation of conversations about climate change.

Younger people are more worried about climate change⁶² and more likely to talk about it, with 41% of millennials and Gen Zers saying they discuss it “often” or “occasionally” with family and friends, compared to 33% of Gen Xers and 34% of Baby Boomers and members of the Silent Generation.⁶³

CLIMATE ANXIETY ON-SCREEN

FIGURE 16 PERCENTAGE OF FILMS WITH A CHARACTER WHO HAS CLIMATE ANXIETY



Only 2% of the 250 films contained a character who is suffering from climate anxiety.⁶⁴

We defined climate anxiety as extreme worry about the present and future due to climate change and other environmental issues.

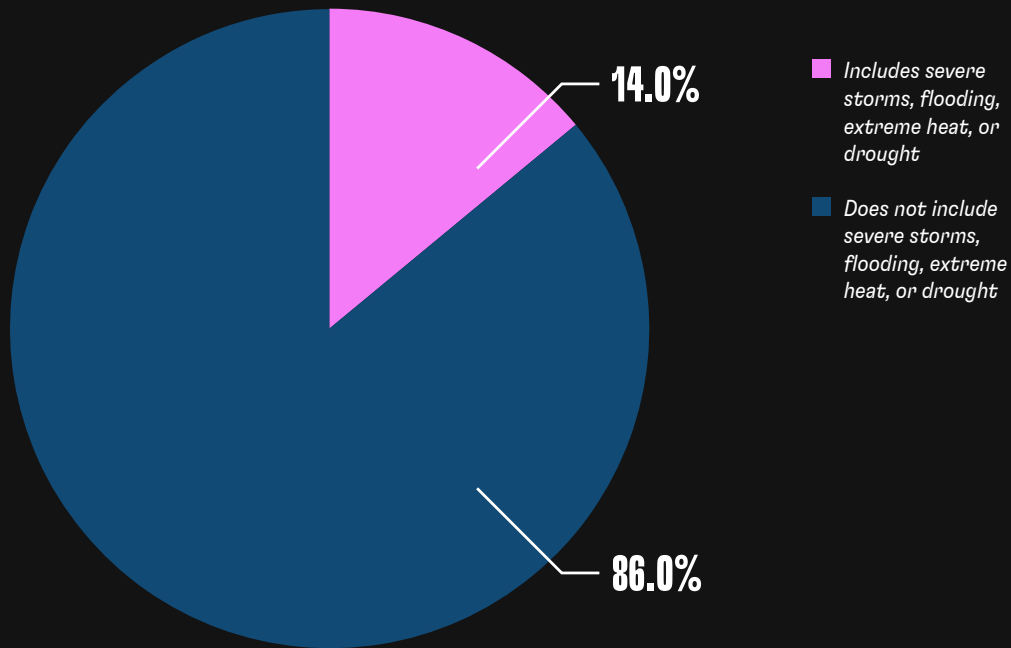
In the real world, climate anxiety has been found to be widespread, especially among young people.

A 2021 survey found that 45% of respondents between the ages of 16 and 25 reported that their feelings about climate change negatively affected their daily lives, while **75% reported finding the future frightening.**

Google searches related to “climate anxiety” or “eco-anxiety” **increased by 4,590%** between 2018 and 2023.⁶⁵

OPPORTUNITIES FOR ADDITIONAL CLIMATE INCLUSION

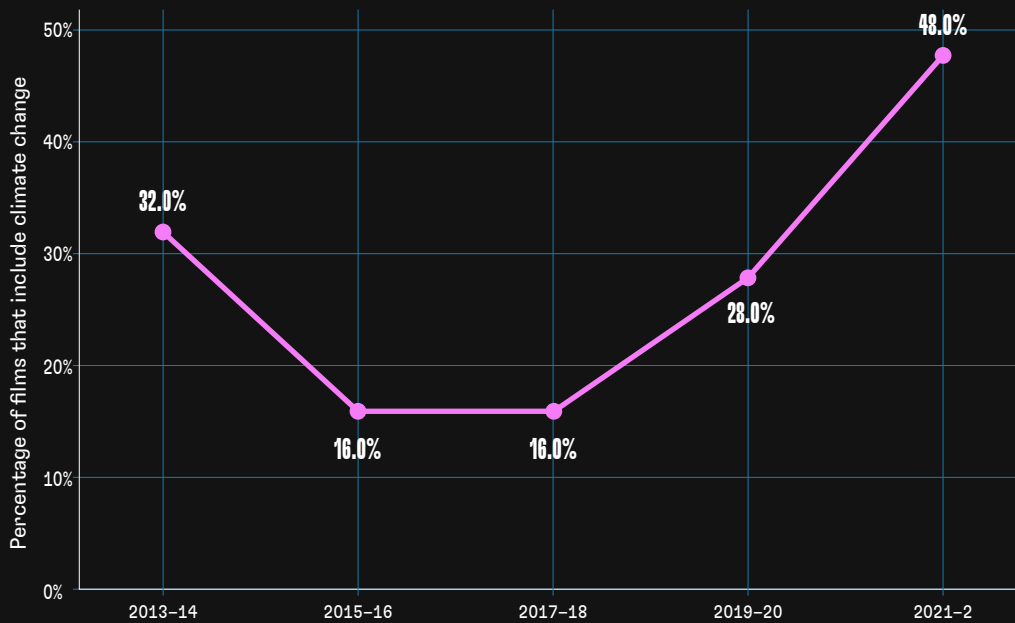
FIGURE 17 THE PERCENTAGE OF FILMS FEATURING COMMON CLIMATE IMPACTS



In addition to coding for the explicit presence of climate change in films, we coded for some of the most common and destructive impacts of climate change: severe storms, flooding, extreme heat, and drought. **We found that only 14% of the films in our sample depicted one or more of these impacts.**

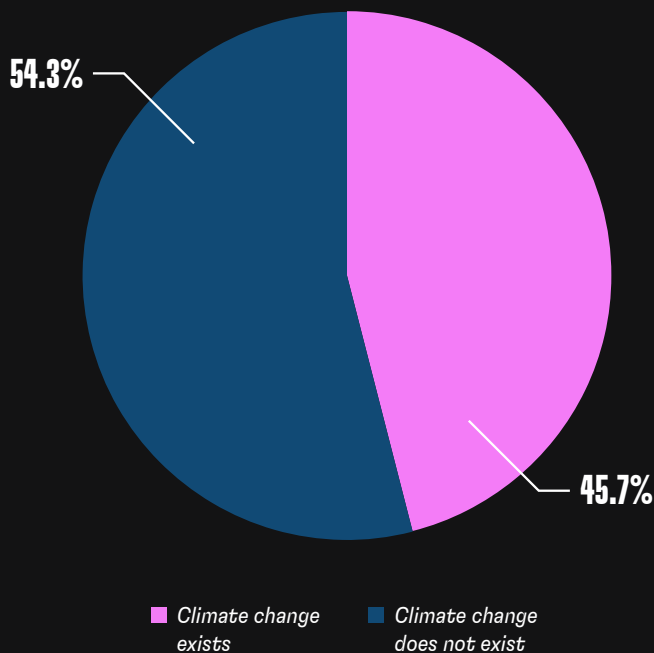


FIGURE 18 THE PERCENTAGE OF FILMS FEATURING COMMON CLIMATE IMPACTS OVER TIME



Just as climate impacts increased in the real world over this decade, depictions of common climate impacts increased significantly in film. Overall, there was a 50% increase in movies containing severe storms, flooding, extreme heat, or drought from the first half of the decade to the second.

FIGURE 19 IN FILMS CONTAINING COMMON CLIMATE IMPACTS, THE PERCENTAGE IN WHICH CLIMATE CHANGE EXISTS



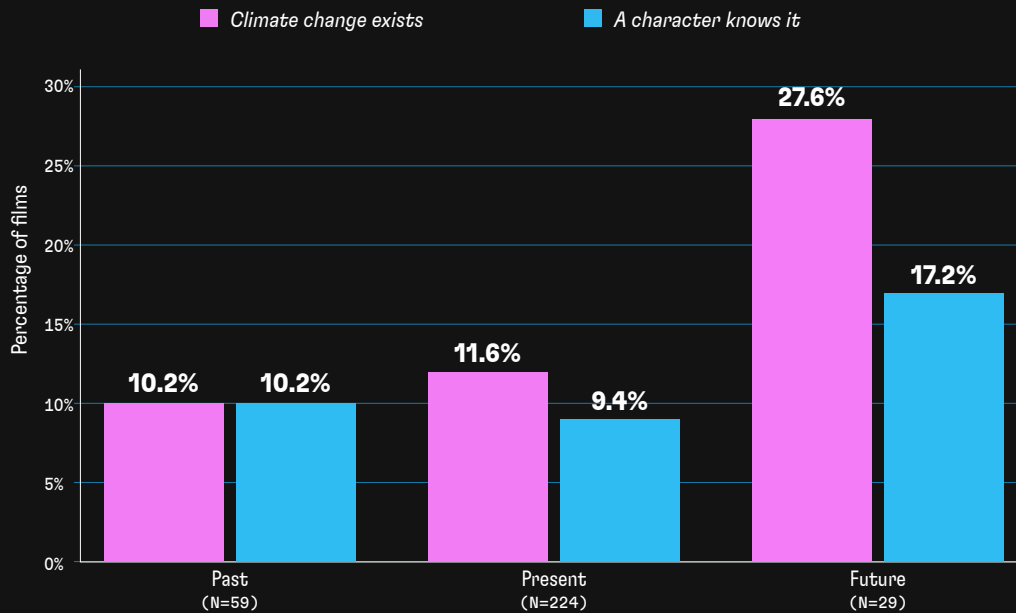
However, these common climate impacts were not always connected to climate change. **In the 40 films that depicted severe storms, flooding, extreme heat, or drought, only 45.7% included climate change in their story worlds.** The other 54.3% did not.

For example, *The Mitchells vs. The Machines* (2021) follows a dysfunctional family whose college-bound roadtrip is thrown off course by a series of unfortunate events and a robot apocalypse. On a muleback canyon tour, disaster strikes when a severe storm floods the canyon and forces the family to evacuate. But despite the film's depiction of an increasingly common climate impact, no connection to climate change is drawn.

These are missed opportunities to highlight for audiences the connection between climate change and its increasingly evident, destructive, and deadly effects.

TEMPORAL SETTING

FIGURE 20 PERFORMANCE ON THE CLIMATE REALITY CHECK BY TEMPORAL SETTING⁶⁶

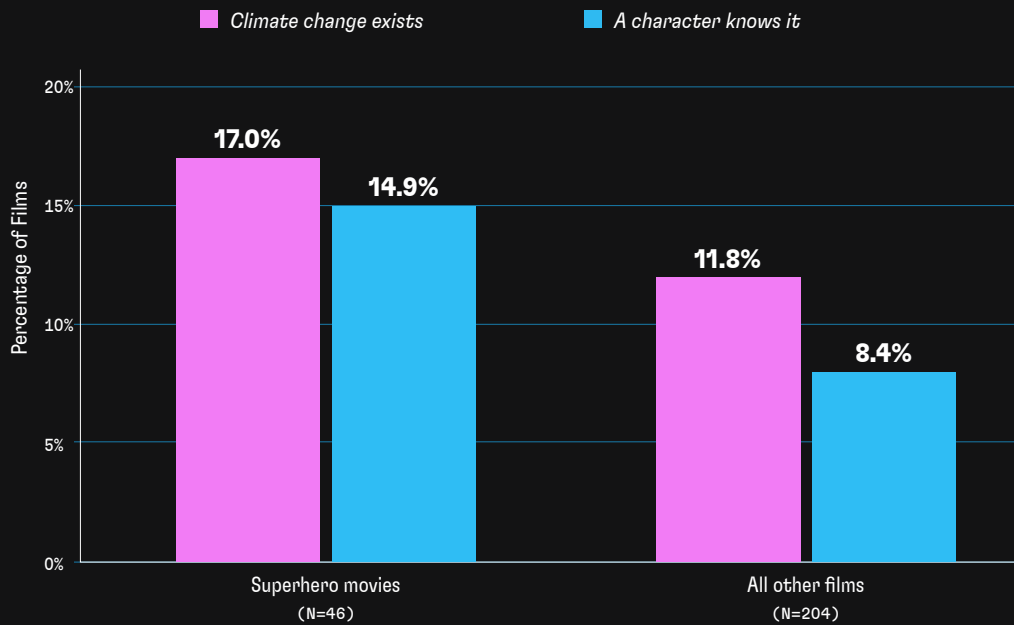


In this sample, as in the real world, climate change seems to increase in importance as time passes. **Only 11.6% of the films set partially or entirely in the present included climate change, compared with 27.5% of the films set partially or entirely in the near future.** The films set in a climate-changed future include *Snowpiercer* (2013), *Interstellar* (2014), and *Blade Runner 2049* (2017); those set in a future without climate change include *Her* (2013), *Ex Machina* (2014), and *Ready Player One* (2018).



SUPERHEROES TO THE RESCUE?

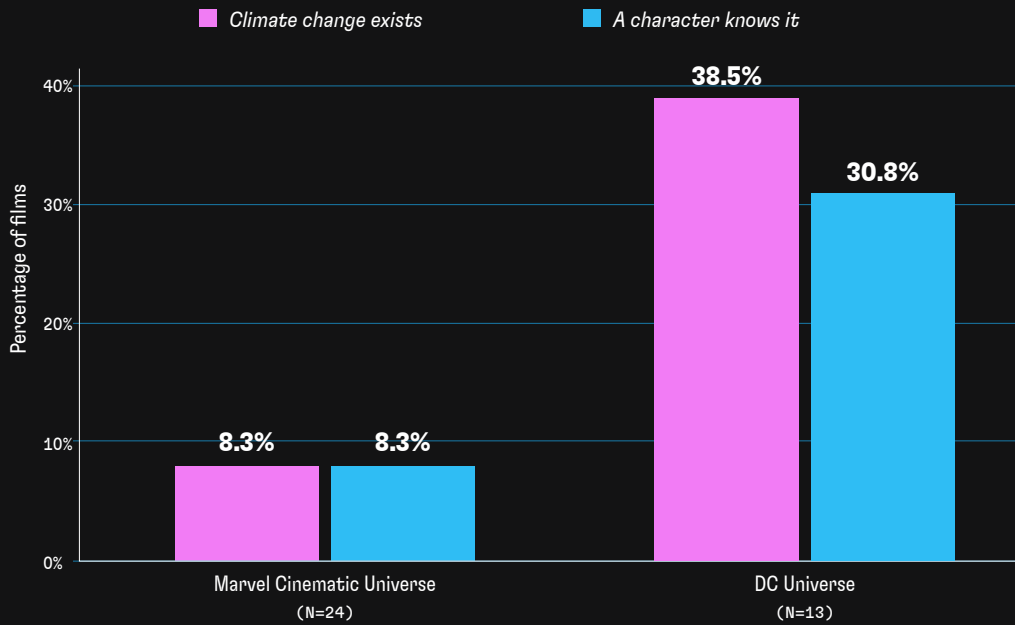
FIGURE 21 PERFORMANCE ON THE CLIMATE REALITY CHECK, SUPERHERO MOVIES VS ALL OTHER FILMS



Over the last 15 years, superhero franchises have become remarkably popular: of the 250 films studied, 18.8% were superhero films, such as *Avengers: Endgame* (2019), *Spider-Man: No Way Home* (2021), and *Aquaman* (2018). These films tended to be more climate conscious than other films: **17.0% of superhero movies passed part one of the Climate Reality Check**, compared to 11.8% of non-superhero movies. Similarly, **14.9% of superhero films passed part two**, while only 8.4% of non-superhero films contained a single character who is aware of climate change.



FIGURE 22 PERFORMANCE ON THE CLIMATE REALITY CHECK, MARVEL CINEMATIC UNIVERSE VS DC UNIVERSE

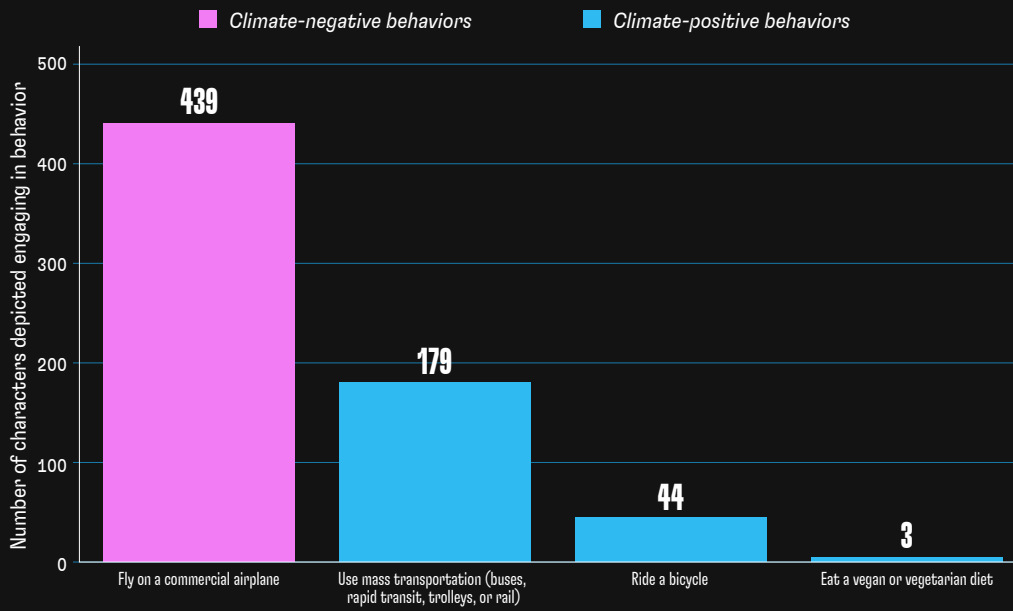


As any superfan knows, not all superhero movies are the same. **Only 8.3% of Marvel films passed parts one and two of the Climate Reality Check. DC films did much more to “save the world,” with 38.5% of its films passing part one, and 30.7% passing part two.**



MODELING CLIMATE BEHAVIOR

FIGURE 23 TOTAL NUMBER OF CHARACTERS WHO ARE DEPICTED OR MENTIONED ENGAGING IN CLIMATE-POSITIVE AND CLIMATE-NEGATIVE BEHAVIORS



One way filmmakers can do their part is through “climate placement,” which is when “climate-friendly behaviors are adopted by characters or woven into the setting or set design of a story, but might not be addressed or mentioned directly.”⁶⁷ Using mass transportation, bicycling instead of driving, and eating less meat are considered the most effective individual actions that people in high-consumption countries can take to limit their climate impact.⁶⁸ Bicycling is also the most popular mode of transport in the world.⁶⁹

By contrast, flying on an airplane is one of the most carbon-intensive actions an individual can engage in, and only 20% of people in the world have ever flown.⁷⁰

Flying on a private jet or commercial airplane was prevalent in these films, while sustainable behaviors were rare. Flying was 2.5 times more common than using mass transportation, 10 times more common than riding a bicycle, and 146 times more common than depicting a character who is vegetarian or vegan.⁷¹ Helicopters and military planes, which are extremely carbon intensive, were not included in this analysis, but were also very common.⁷²

However, it should be noted that these behaviors are not substitutable, and that the lack of public transportation in some places means that realistic storytelling sometimes requires characters to fly.

CONCLUSIONS

In 2016, critic Amitav Ghosh asserted that in the future, people suffering from climate chaos will look back and conclude that “most forms of art” in the early twenty-first century “were drawn into modes of concealment that prevented people from recognizing the realities of their plight.”⁷³

The results of this application of the Climate Reality Check to 250 of the most popular films released between 2013 and 2022 corroborate that claim. During this critical period in human history, when the climate crisis was widely understood, when its destructive and deadly consequences were becoming more evident, and when it was still possible to avoid some of the worst outcomes, only one out of every eight of the most popular films set in the present on this planet even acknowledged the reality of climate change. Given the power of entertainment media, popular films’ climate avoidance perpetuates the socially organized denial of the crisis.⁷⁴

Today, films set in the present or near future that do not include climate change should be considered what they are: fantasy.⁷⁵ Fantasy has its place, but consistently presenting fantasy as reality makes it harder for individuals to come to terms with a rapidly changing world. It makes it harder for policymakers at various levels to amass the necessary support to execute the transformational shifts that are now needed if we are to maintain a livable planet. And it makes it harder for individuals, communities, and nations to adapt to the climate impacts that are increasingly evident, destructive, and fatal.

However, our analysis identified some promising trends. The presence of climate change nearly doubled in the last five years we examined—an important sign of progress. Depictions of climate impacts also doubled. Streamers (Netflix, Amazon Studios, and Apple TV+) demonstrated that including climate change in more films is not difficult. And the films that included climate change performed better than those that didn’t. This should allay concerns that climate change is such a divisive or political issue that its inclusion would lead to poor performance at the box office.

Ultimately, whether climate change is included in the films that reach the most viewers is highly dependent on the actions of the five major studios that dominate North American film production and distribution. Films made by Warner Bros., Paramount Pictures, Sony Pictures, Walt Disney Studios, and Universal Pictures account for an estimated 80–85% of US box office revenue. These companies distributed 70% of the films in our sample and represented 90% of the total box office gross.⁷⁶

“Films that included climate change performed better at the box office than those that didn’t.”

Fortunately, each of these studios has recently affirmed the importance of telling sustainable stories, and publicly committed to doing so:

Warner Bros. stated in 2023 that

“no matter how big or small the message may be, we aim to incorporate environmentally conscious themes in our stories that leave lasting effects on audiences.”⁷⁷

Paramount Pictures proclaimed in 2022 that it is

“more committed than ever to [its] duty and opportunity to deliver responsible, informative, and culturally powerful content that can help shape a more sustainable and inclusive world.”⁷⁸

Sony Pictures affirmed in 2022 that it knows

“entertainment has the power to influence public discourse” and strives “to showcase environmentally responsible choices, behaviors, and messages on small screens and big screens alike.”⁷⁹

Walt Disney Studios vowed in 2023 that it is

“focused on creating stories and experiences that inspire connection with our planet and all who call it home.”⁸⁰

Universal Pictures pledged in 2023 to ensure

“that sustainability is built into the planning process from the beginning including script development, locations and set needs, as well as on-screen behaviors.”⁸¹



The results of this study demonstrate that the film industry has a way to go, but these public commitments and the positive trends we identified are hopeful signs—for our stories and our world.

RECOMMENDATIONS

A growing body of research shows that TV and films that acknowledge the climate crisis connect more with today's audiences, make good business sense, and can contribute to crucial social change.

Good Energy has called for 50% of all new films to pass the Climate Reality Check by 2027. This is wholly possible. Climate change pervades all areas of life today, which means there are endless opportunities to include climate authentically in any and every story.⁸²

We hope the following recommendations inspire writers and spotlight the power of stories in the age of climate change:

1 More mentions are more helpful.

A single reference to climate change is a great start and might be all that is possible in some stories. But a passing mention might get lost. More clear references to the climate crisis are more likely to lead audiences to view it as a high-priority issue that demands attention and action.⁸³ This can be accomplished through films and TV shows that center the climate crisis, but also through repeated climate mentions.

2 Climate has a place in all genres.

Most films that passed the Climate Reality Check were in the sci-fi, adventure, and superhero genres, perhaps because these genres tend to operate on epic, global scales. But climate change isn't just a story about distant locations or the end of the world; it's affecting the places we live and our own communities, loved ones, parents, and children. And even when life is hard, we still laugh and scheme and fall in love—the stories of our lives go on. The climate crisis can be creatively and authentically incorporated into films of any genre.

3 Include aware, concerned, and engaged characters.

Americans underestimate how concerned others are about climate change, and this contributes to a “spiral of silence” about the subject. If people don't even talk about a problem, they won't be able to respond to it. When characters are aware of, talk about, or take action on climate change, it normalizes and models climate conversations and actions for everyday audiences in the real world.

4**Create more diverse climate characters.**

Fictional characters who are currently shown caring about or being impacted by climate change are overwhelmingly white, male, and middle-aged. The reality is different: young people care the most about climate change, and Black, Indigenous, and other people of color are most impacted by it.

5**Model positive climate actions.**

Portraying characters who engage in climate-friendly behaviors like bicycling, using public transportation, eating less meat, and using renewable energy can make an impact, whether or not climate change is included in a story. This is something that some studios already recognize: Netflix, for example, recently announced that it would feature more electric vehicles.⁸⁴

**Climate change is the biggest story of our time.**

It's also an incredibly exciting story, replete with drama, comedy, tragedy, horror, adventure, love, conflict, real-life villains, massive stakes, and a million potential heroes from all walks of life.

Storytellers can help us face and respond to the existential crisis that is unfolding around us—and in doing so, **they might just help save the world.**

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- 85 According to the website [Semrush](#), as of August 2023 IMDb was the sixty-fourth most visited site globally. One limitation of using ratings from a film website is that they serve as a proxy for aggregate popularity only among audiences who speak the languages in which the website appears—in this case English, French, German, Hindi, Italian, Portuguese, and Spanish.
- 86 Gary K. Wolfe, *Critical Terms for Science Fiction and Fantasy: A Glossary and Guide to Scholarship* (Greenwood Press, 1986), 52.
- 87 A Cohen's Kappa value of 1.00 indicates perfect reliability (100% agreement). Scores between 0.81 and 1.00 indicate almost perfect agreement, scores between 0.60 and 0.80 substantial agreement, and scores between 0.41 and 0.60 moderate agreement.
- 88 This is consistent with the purpose of the Cohen's Kappa test, which is to demonstrate the degree of reliable coding that occurs when both coders observe a film or film character.
- 89 As of May 11, 2023.
- 90 Soraya Giaccardi, Adam Rogers, and Erica L. Rosenthal, "[A glaring absence](#)," 8.

ABOUT US

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This research was made possible by a grant from Colby College's [Buck Lab for Climate and Environment](#), a nexus for Colby students, faculty, and community partners to collaborate on environmental scholarship, teaching and learning, civic engagement, and career explorations. The Buck Lab is an incubator to incentivize new and broad-reaching interdisciplinary work to further understand and solve the world's daunting environmental and climate-related challenges. By disseminating the insights gained from the environmental work of students, faculty, and staff, the Buck Lab creates a visible public face for Colby's contributions to the study of the environment.

[Good Energy](#) is a nonprofit story consultancy for the age of climate change. Our mission is to inspire, support, and accelerate stories in scripted TV and film that reflect the world we live in now—and help us envision a better future. We aim to make it as easy as possible to portray the climate emergency on-screen in entertaining and artful ways, in any storyline, across every genre. Made up of writers, artists, academics, and experts who understand the human side of climate change, Good Energy bridges the gap between climate experts, people on the front lines of the crisis, and industry creatives.

[The Climate Reality Check](#) was created by Matthew Schneider-Mayerson and members of Good Energy: **Anna Jane Joyner** (founder and CEO), a long-time strategist at the intersection of climate, communications, and storytelling who has consulted on more than 100 TV, film, and podcast projects; **Carmiel Banasky** (editor in chief), a critically acclaimed novelist, WGA TV and feature writer, and audio-drama creator, specializing in climate fiction; and **Bruno Olmedo Quiroga** (director of strategy), a design researcher, strategist, storyteller, IDEO alum, and cofounder of Maybe Ventures.

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APPENDIX A

Content Analysis Methodology

Sample selection

We sought to apply the Climate Reality Check to the most popular films from the last decade and examine the presence of climate change in contemporary films more broadly. With the rise of straight-to-streaming film releases, annual box office gross is no longer a definitive measure of a film's popularity. As such, we hypothesized that the number of ratings on a popular film-review platform would serve as a proxy for aggregate popularity across both theatrical and straight-to-streaming releases. Unlike box office gross, these ratings also capture engagement generated by viewings on cable or streaming services. We chose IMDb because it is the most popular English-language online movie database,⁸⁵ and it displays the number of ratings each film has received.

We generated lists of the 100 most rated feature films (as of May 11, 2023) from IMDb's search portal for each year from 2013 to 2022. We started with the 25 most rated films for each year and selected from the twenty-sixth to the fifty-second most rated films as needed, to replace films that did not meet our inclusion criteria.

Our analysis excluded films that were nonfictional, high fantasy, not set on Earth, and/or set before the year 2006 or after the year 2100.

Nonfiction films such as documentaries were excluded because the Climate Reality Check is intended to apply to fictional films. High fantasy was excluded because it is set in a different universe, in which climate change may or may not be occurring. To distinguish between high and low fantasy, we applied science-fiction critic Gary K. Wolfe's influential distinction: high fantasies are "set in a secondary world," while low fantasy "contains supernatural intrusions into the 'real' world."⁸⁶

Films that were not set on this planet were excluded, since they would not be expected to reflect or mention the environmental problems on Earth.

Finally, films that were clearly set before 2006 and/or after 2100 were excluded. We chose these dates after consultation with climate scientists and experts on public opinion about climate change. We selected 2006 as the start date because public concern about climate change had not developed before that date to such an extent that most films could be expected to include climate change in their story worlds. We selected 2100 as the end date because regardless of the actions taken in the near future, the effects of climate change are expected to be significant enough until 2100 that they will have a major impact on life on Earth, and thus deserve inclusion in films.

Films that were set in two different time periods, or only partially on Earth, were only included in the data set if half or more of the film was set on Earth between 2006 and 2100.

Starting with the 25 most rated films in each year, excluding the films that did not qualify, and then continuing down the list as necessary, we excluded 170 films, or 40% of the total films considered, to arrive at our data set of 250 films.

Coder training and interrater reliability

Six coders were trained to watch selected films and code them for relevant content. Before coding, the team tested and refined the codebook and training procedures over the course of two months. At introductory training sessions, coders reviewed the codebook and then analyzed the same film, randomly selected from our sample of recent most rated films that met the inclusion criteria. Inconsistencies in responses were identified and discussed, resulting in minor revisions to the codebook. Another film was then randomly selected and assigned, followed by the same discussion and revision process. This process was conducted a total of four times.

Next, to establish interrater reliability, we assigned 10% of the sample (25 films) to be coded by multiple coders who were randomly selected. We used Cohen's Kappa and the Pearson correlation as interrater reliability measures for nominal and metric data respectively. We deliberately included in this subsample 13 films that seemed likely to contain climate content (based on IMDb tags, descriptions, and trailers), in an effort to maximize reliability on climate-related items from the outset. Items that achieved adequate reliability were retained in the codebook unchanged. Once the codebook was finalized, the remaining 225 films were divided among the coders, and a further 25 of them were randomly selected for double-coding, for a total of 50 double-coded films. These double-coded films were used for final reliability calculations.

Coding procedure

At the film level, coders identified whether each film (N=250) was set in the past, the present, and/or the future; whether climate change was present or absent in its story world; whether any characters were aware of climate change; and whether severe storms, flooding, extreme heat, or drought were depicted or mentioned. At the character level, coders noted whether any characters flew on a commercial airplane, used mass transportation (buses, rapid transit, trolleys, and rail), rode a bicycle, or were identified as vegetarian or vegan. If a character was aware of climate change (N=84), coders noted their gender, race or ethnicity, and age.

APPENDIX B

Codebook and Reliability Scores

Cohen's Kappa test for interrater reliability for nominal data

Film-level variables

Item	Score⁸⁷
Film name	1.0
Year	1.0
Climate change exists in the story world (Y/N)	0.772
Film includes characters that are aware of climate change (Y/N)	0.788
Severe storms, flooding, extreme heat, or drought are depicted or mentioned (Y/N)	0.605
At least one scene contains a clear reference to climate change (Y/N)	0.752

Character-level variables

The Cohen's Kappa tests conducted for the character-level variables are limited to characters that both coders recognized as being aware of climate change.⁸⁸

Item	Score
What is the name of the [nth] character who is aware of climate change?	1.0
Character gender <ul style="list-style-type: none"> • Man (cis or trans) • Woman (cis or trans) • Nonbinary • Can't tell/unable to judge/not applicable 	1.0

Continues on next page →

<p>Character age</p> <ul style="list-style-type: none"> • 10 or younger • 11–17 • 18–30 • 31–64 • 65+ • Can't tell/unable to judge/not applicable 	0.723
<p>Character race/ethnicity</p> <ul style="list-style-type: none"> • White • Black/African American • Hispanic/Latinx • East Asian/Pacific Islander • Middle Eastern/South Asian • Mixed/other • Can't tell/unable to judge/not applicable 	1.0
<p>How many characters fly on a commercial airplane?</p> <ul style="list-style-type: none"> • 0 characters • 1 or more characters 	0.802
<p>How many characters use mass transportation?</p> <ul style="list-style-type: none"> • 0 characters • 1 or more characters 	0.562
<p>How many characters ride a bicycle?</p> <ul style="list-style-type: none"> • 0 characters • 1 or more characters 	0.608
<p>How many characters are vegetarian and/or vegan?</p> <ul style="list-style-type: none"> • 0 characters • 1 or more characters 	1.0

APPENDIX C

List of Films

The list of films analyzed and their rank among IMDb's most rated films for their year of release.⁸⁹

Films that passed both parts of the Climate Reality Check are indicated with a double checkmark (✓✓); films that passed only the first part are indicated by a single checkmark (✓).

2013		2014		2015	
Rank	Title	Rank	Title	Rank	Title
2	<i>Iron Man 3</i>	1	<i>Interstellar</i> ✓	1	<i>Mad Max: Fury Road</i>
4	<i>Man of Steel</i>	3	<i>Gone Girl</i>	3	<i>Avengers: Age of Ultron</i>
5	<i>Prisoners</i>	4	<i>Whiplash</i>	7	<i>Ant-Man</i>
11	<i>Now You See Me</i>	5	<i>Captain America: The Winter Soldier</i>	8	<i>Jurassic World</i>
13	<i>Her</i>	9	<i>Edge of Tomorrow</i>	11	<i>Spectre</i>
15	<i>Oblivion</i>	10	<i>John Wick</i>	12	<i>The Big Short</i>
17	<i>Pacific Rim</i> ✓ ✓	11	<i>Kingsman: The Secret Service</i> ✓ ✓	13	<i>Sicario</i>
22	<i>The Wolverine</i>	12	<i>Birdman or (The Unexpected Virtue of Ignorance)</i>	14	<i>Room</i>
23	<i>Captain Phillips</i>	13	<i>Nightcrawler</i>	15	<i>Fast & Furious 7</i>
24	<i>We're the Millers</i>	14	<i>Ex Machina</i>	16	<i>Mission: Impossible—Rogue Nation</i>
26	<i>This Is the End</i>	16	<i>The Amazing Spider-Man 2</i> ✓ ✓	18	<i>Fifty Shades of Grey</i>
27	<i>Despicable Me 2</i>	17	<i>Lucy</i>	21	<i>Creed</i>
28	<i>Fast & Furious 6</i>	25	<i>Dawn of the Planet of the Apes</i>	22	<i>Get Hard</i>

29	Snowpiercer ✓	26	Godzilla	24	The Lobster
30	Monsters University	27	22 Jump Street	25	Maze Runner: The Scorch Trials ✓ ✓
31	About Time	28	The Fault in Our Stars	26	The Intern
32	The Secret Life of Walter Mitty	30	The Equalizer	27	Chappie
33	The Hangover Part III	32	Boyhood	28	Focus
35	The World's End	34	The Interview	29	Spy
36	Olympus Has Fallen	35	Transformers: Age of Extinction	31	Southpaw
37	Kick-Ass 2	36	Neighbors	32	San Andreas
38	Escape Plan	39	Non-Stop	35	Ted 2
40	Don Jon	41	It Follows	45	Fantastic Four ✓ ✓
42	Warm Bodies	42	RoboCop	46	The Gift
43	The Purge	43	The Babadook	47	Pitch Perfect 2

2016		2017		2018	
Rank	Title	Rank	Title	Rank	Title
1	Deadpool	1	Logan	1	Avengers: Infinity War
2	Captain America: Civil War	5	Spider-Man: Homecoming	2	Black Panther
3	Doctor Strange	8	Get Out	3	Deadpool 2
4	Arrival	9	Blade Runner 2049 ✓	4	Spider-Man: Into the Spider-Verse
5	Batman v Superman: Dawn of Justice	11	Baby Driver	6	A Quiet Place
6	Suicide Squad	14	John Wick: Chapter 2	8	Venom ✓ ✓
8	La La Land	15	Justice League ✓ ✓	9	Aquaman ✓ ✓

10	<i>Split</i>	17	<i>Jumanji: Welcome to the Jungle</i>	10	<i>Ready Player One</i>
11	<i>Zootopia</i>	18	<i>Kingsman: The Golden Circle</i>	11	<i>Ant-Man and the Wasp</i>
14	<i>Jason Bourne</i>	27	<i>War for the Planet of the Apes</i>	12	<i>A Star Is Born</i>
17	<i>10 Cloverfield Lane</i>	28	<i>Wind River</i>	14	<i>Bird Box</i>
18	<i>Moonlight</i>	29	<i>The Fate of the Furious</i>	15	<i>Mission: Impossible—Fallout</i>
19	<i>The Accountant</i>	30	<i>The Big Sick</i>	16	<i>Hereditary</i>
20	<i>Now You See Me 2</i>	31	<i>The Hitman's Bodyguard</i>	17	<i>Annihilation</i>
21	<i>Manchester by the Sea</i>	32	<i>Mother!</i>	18	<i>Jurassic World: Fallen Kingdom</i>
22	<i>Nocturnal Animals</i>	35	<i>Ghost in the Shell</i>	22	<i>Game Night</i>
23	<i>Finding Dory</i>	38	<i>The Mummy</i>	23	<i>Ocean's 8</i>
24	<i>Don't Breathe</i>	40	<i>Baywatch</i>	24	<i>Tomb Raider</i>
25	<i>Kimi no na wa (Your Name)</i>	43	<i>Molly's Game</i>	27	<i>Upgrade</i>
27	<i>Sully</i>	44	<i>Wonder</i>	28	<i>Red Sparrow</i>
30	<i>Me Before You</i>	45	<i>The Killing of a Sacred Deer</i>	29	<i>Crazy Rich Asians</i>
32	<i>Lion</i>	48	<i>Transformers: The Last Knight</i>	30	<i>The Meg</i>
34	<i>Hell or High Water</i>	50	<i>Logan Lucky</i>	31	<i>Isle of Dogs</i>
35	<i>Ghostbusters</i>	51	<i>Happy Death Day</i> ✓ ✓	32	<i>Rampage</i>
36	<i>Busanhaeng (Train to Busan)</i>	52	<i>Despicable Me 3</i>	34	<i>Searching</i>

2019		2020		2021	
Rank	Title	Rank	Title	Rank	Title
2	<i>Avengers: Endgame</i>	1	Tenet ✓ ✓	1	<i>Spider-Man: No Way Home</i>
3	Gisaengchung (Parasite) ✓	2	<i>Soul</i>	3	Don't Look Up ✓ ✓
5	<i>Knives Out</i>	4	<i>Birds of Prey</i>	4	<i>No Time to Die</i>
8	<i>Spider-Man: Far from Home</i>	5	<i>A Quiet Place Part II</i>	5	Zack Snyder's Justice League ✓ ✓
13	<i>John Wick: Chapter 3—Parabellum</i>	6	<i>The Invisible Man</i>	6	<i>Shang-Chi and the Legend of the Ten Rings</i>
14	<i>Shazam!</i>	7	<i>Extraction</i>	7	<i>Black Widow</i>
15	<i>The Gentlemen</i>	9	<i>Promising Young Woman</i>	8	<i>Free Guy</i>
16	Midsommar ✓ ✓	11	<i>Druk (Another Round)</i>	9	<i>The Suicide Squad</i>
17	Marriage Story ✓ ✓	12	<i>The Old Guard</i>	10	Eternals ✓ ✓
18	<i>Us</i>	13	<i>Nomadland</i>	11	<i>Red Notice</i>
19	<i>Uncut Gems</i>	14	<i>Palm Springs</i>	12	<i>Nobody</i>
20	<i>It Chapter Two</i>	15	<i>The Father</i>	15	<i>Venom: Let There Be Carnage</i>
23	<i>El Camino: A Breaking Bad Movie</i>	16	<i>Bad Boys for Life</i>	17	Godzilla vs. Kong ✓ ✓
24	<i>Jumanji: The Next Level</i>	19	<i>Sonic the Hedgehog</i>	18	The Tomorrow War ✓ ✓
25	<i>Toy Story 4</i>	20	<i>Borat Subsequent Moviefilm: Delivery of Prodigious Bribe to American Regime for Make Benefit Once Glorious Nation of Kazakhstan</i>	21	<i>Ghostbusters: Afterlife</i>
27	<i>Glass</i>	22	<i>I Care a Lot</i>	22	Wrath of Man ✓ ✓
29	<i>El Hoyo (The Platform)</i>	23	<i>Love and Monsters</i>	24	<i>Mortal Kombat</i>

31	<i>Fast & Furious Presents: Hobbs & Shaw</i> ✓ ✓	24	<i>Dil Bechara</i>	25	<i>Radhe</i>
33	<i>Doctor Sleep</i>	25	<i>Greenland</i>	26	<i>Army of the Dead</i>
35	<i>Godzilla: King of the Monsters</i> ✓	26	<i>The Hunt</i> ✓ ✓	34	<i>CODA</i> ✓
36	<i>Zombieland: Double Tap</i>	27	<i>Soorarai Pottru</i>	36	<i>F9</i>
37	<i>6 Underground</i>	30	<i>Eurovision Song Contest: The Story of Fire Saga</i>	37	<i>The Guilty</i> ✓
38	<i>Terminator: Dark Fate</i>	31	<i>Sadak 2</i>	38	<i>Old</i>
41	<i>Pokémon: Detective Pikachu</i> ✓ ✓	32	<i>365 Dni (365 Days)</i>	44	<i>The Mitchells vs the Machines</i>
43	<i>Ready or Not</i>	33	<i>Project Power</i>	45	<i>The Unforgivable</i>

2022	
Rank	Title
1	<i>The Batman</i> ✓
2	<i>Top Gun: Maverick</i>
4	<i>Everything Everywhere All at Once</i>
5	<i>Doctor Strange in the Multiverse of Madness</i>
6	<i>Glass Onion</i> ✓ ✓
9	<i>Bullet Train</i>
10	<i>The Menu</i>
11	<i>Black Panther: Wakanda Forever</i>
12	<i>Black Adam</i>
14	<i>Uncharted</i>

15	Nope
16	The Gray Man
17	The Adam Project
22	Jurassic World Dominion ✓ ✓
27	Barbarian
28	The Whale
30	Morbius
31	Scream
33	The Lost City
34	Hustle
35	Triangle of Sadness ✓ ✓
38	Smile
39	The Unbearable Weight of Massive Talent
43	Brahmāstra Part One: Shiva
45	M3GAN

APPENDIX D

The Presence of Climate Change in Popular Films

As noted in the Results section, we found that climate change exists in only 12.8% of the 250 films analyzed. However, readers who are familiar with research on environmental media might note that 12.8% is a higher rate than other researchers have found.

Specifically, USC's Media Impact Project searched for the mentions of 36 keywords related to climate change in 37,453 scripted TV episodes and films between 2016 and 2020, and found that only 2.8% of analyzed scripts included any of the keywords.⁹⁰ During the same period (2016 to 2020), we found that climate change was present in 13.4% of the films we analyzed—almost five times more.

Why are these results so different? Some of the difference is due to the data sets of the two studies. First, we excluded 40% of the most rated films released between 2013 and 2022, because they are high fantasy, set before 2006 or after 2100, and/or not set on Earth. Most of these films are unlikely to include anthropogenic climate change in their story worlds. Second, the Media Impact Project included both television shows and films, whereas we only considered films.

The rest of the difference is likely due to the methodologies in the two studies. In our analysis, the presence of climate change was often conveyed in ways that a keyword search would not identify.

In the film *Midsommar* (2019), for example, a speaker at a summer solstice ceremony remarks that “it’s the hottest and brightest summer on record.” This comment demonstrates that climate change is occurring in the world of *Midsommar*.

Similarly, in the film *Marriage Story* (2019), a character is described as “energy conscious,” and conspicuously turns off the lights in two scenes. A different character loses power and is not able to close the gate in front of her house because of “rolling blackouts in the hills” of Los Angeles. These scenes demonstrated that climate change is occurring in the world of *Marriage Story*.

In both cases, the Media Impact Project’s keyword search would not identify the presence of climate change. Many of the films that passed part one of the Climate Reality Check were similar to *Midsommar* and *Marriage Story*, in that they did not use the most obvious terms for climate change, but they clearly indicated its presence.