Movie-ing Forward

Climate Change Narratives and Imaginaries in Children's Animated Films

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A thesis submitted in partial fulfillment of the requirements of Lund University International

Master's Programme in Environmental Studies and Sustainability Science

Submitted September 27th, 2023

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Abstract:

Children primarily learn about climate change (CC) through media, including children's films. Films can influence emotions, shaping perceptions and actions regarding CC. However, research focusing on media narratives consumed by children is lacking, leaving a significant knowledge gap.

To bridge this gap, this study employed narrative analysis, examining CC depictions in six children's animated films. Utilizing a theoretical framework of imaginaries, the study explored the role of these films in imagining alternative climate futures.

Contrary to previous research emphasizing pessimistic themes in climate films, this analysis unveiled an unexpected and hopeful narrative of the future. The films delved into complex themes like climate justice and human-nature relationships but maintained a fearful framing through violence and urgency.

While generally aligning with dominant climate imaginaries, these films presented unique variations, highlighting diverse perspectives. Understanding these nuanced narratives offers insights into how children perceive CC through media, potentially shaping their actions towards sustainability.

Word count: 11,986

Acknowledgements

Table of Contents

List of Figures

List of Tables

1 Introduction

1.1 Climate Change and Pop-Culture

Climate change is a complex issue that is understood to be as much of a political, social, and cultural issue, as it is a scientific one. New scientific knowledge on the topic must challenge dominant social framings and existing knowledge structures (Yusoff & Gabrys, 2011). As a result, researchers have begun to move beyond climate science to new interdisciplinary and transdisciplinary fields, both inside and outside of academia, such as in climate communication and the role of pop-culture, which will be the focus of this thesis (Yusoff & Gabrys, 2011).

The general public receives most of its information on climate change through forms of mass-media (e.g. news outlets, social media, film, television, and literature) (O'Neill & Nicholson-Cole, 2009; Smith, 2022). Media is saturated with climate change stories and representations, which can have a big influence on people's perceptions on the topic (Meifert-Menhard, 2020; O'Neill & Nicholson-Cole, 2009).

Pop-culture "functions to transmit stories that shape how people come to know about social reality" (Baker, 2020, p.142), meaning it affects the way we experience everyday life. It can therefore be an important tool to increase awareness and understanding of the subject to the masses, as well as potentially bring about behavioral changes (Sakellari, 2015)**.** Furthermore, entertainment narratives "have the power to break down barriers, inspire action, and empower audience members to envision a better world" (Giaccardi et al., 2022, p.19), offering fresh possibilities and viewpoints regarding humanity's ability to respond to climate change (Leichenko & O'Brien, 2019). Art can "provide [a] direct link to emotions and introduce new ways of relating to the past, present, [and] future" (Leichenko & O'Brien, 2019, p.72). Narrative, visual, and performative arts are a powerful way of creating a shared understanding about climate change and the challenges around it (Galafassi, Kagan, et al., 2018). Milkoreit (2017), argues that the "makers of culture" (p.9) have often been ignored in climate research, even though their work (such as books, films, TV shows, etc.) can often reach millions of people. Although the primary purpose of such media is to entertain, pop-culture simultaneously functions as a means of replicating and disseminating narratives within larger communication networks. In essence, pop-culture is a powerful tool for producing narratives that influence how society views itself and justifies its actions. (Baker, 2020)

Additionally, in their study, Morote & Hernández (2022) found that school children mainly obtain their information on climate change through digital media (TV/movies, Internet, and social networks). Despite this, little to no research is being done on the narratives and content found within the media children are watching.

Fictional stories, pervasive in various forms of media like children's films, have a significant influence on young minds. According to Reynolds (2011), children's stories are "one of the earliest ways in which the young encounter stories, [and they play] a powerful role in shaping how we think about and understand the world" (p.4). Stories for children are "bound up with education of one kind or another, they can be important carriers of information about changes in culture, present and past" (Reynolds, 2011, p.4). They often present future visions that can influence young readers by introducing societal norms, values, and perspectives, and can reinforce existing beliefs and stimulate novel ways of envisioning a potentially improved world. Children's stories often encourage readers to think and act in particular ways, which is why it is important to examine the narratives behind these stories to understand the messages about climate change that children are receiving through the media. (Reynolds, 2011)

This thesis begins to bridge an existing knowledge gap by exploring the narratives being communicated to children through media about climate change and climate futures, using children's animated films as a starting point to get the discussion started.

1.2 Pop-Culture and the Future

Furthermore, in recent years, the field of future studies has garnered increased attention, particularly within risk and disaster management, as well as scenario building (Luke, 2015; Yusoff & Gabrys, 2011). As Yusoff & Gabrys (2011) point out, "there has been a concentration on the futurity of climate change" (p.517). However, a noticeable knowledge gap persists regarding "how the arts and humanities could contribute to future narratives" (Yusoff & Gabrys, 2011, p.518), meaning there has been a lack of focus on how the creative industries might assist in envisioning alternative climate futures (Nikoleris et al., 2017).

Most future studies have focused on official documents, media coverage and expert opinions, neglecting the rich terrain of pop-culture, limiting our understanding of how future narratives circulate in the public sphere (Rudek, 2022; Yusoff & Gabrys, 2011). "The arts and humanities have long been involved in the creation of future environments, whether through science-fiction imaginings of possible catastrophes; designs for new environments; or through speculative proposals for

environmental practices" (Yusoff & Gabrys, 2011, p.519). They provide us with tangible expressions of imaginative worlds that extend beyond the confines of the present and of what is possible now (Yusoff & Gabrys, 2011).

Imagination is often limited by reality, making it challenging to envision alternative future realities that diverge significantly from the known (Milkoreit, 2017). As Milkoreit (2017) points out, our brains tend to seek coherence with existing knowledge, making it difficult to generate alternative ideas. Nevertheless, it is crucial to explore these disruptive concepts. Children's films, characterized by their emphasis on imaginary worlds, operate with fewer constraints from reality, allowing them to potentially transcend conventional realism and conceive disruptive and unconventional ideas. Fiction possesses the capacity to stretch our imagination (Nikoleris et al., 2017). It is important to explore the future narratives in creative mediums, and therefore, this thesis will also delve into the narratives around climate futures within the studied films.

1.3 Research Aim and Questions

The aim of this thesis is to investigate and analyze the portrayals of climate change and climate futures within children's animated films. It employs a theoretical framework of imaginaries and examines the role of these films in imagining alternative climate futures.

The thesis seeks to address the following research questions:

RQ1: *a)* How is climate change depicted in children's animated films? *b)* And how are climate futures represented in them?

RQ2: How are the narratives around climate change being constructed in children's animated films?

RQ3: What do children's animated films tell us about society's capacity to imagine alternative climate futures?

1.4 Contribution to Sustainability Science

The interdisciplinary and transdisciplinary nature of sustainability science aims to address sustainability challenges by integrating multiple disciplines and engaging beyond academia (Lang et al., 2017; Spangenberg, 2011). Spangenberg (2011) states that sustainability science is a field "defined by problems rather than by the disciplines it employs" (p. 276), meaning that it is a problem-driven and solution-oriented field, which aims to offer actionable solutions to make sustainability a reality in our world (Kates et al., 2001; Lang et al., 2017).

The current generation of children is unique, being the first to grow up with the constant threat of climate change (Rousell & Cutter-Mackenzie-Knowles, 2022). As future torchbearers, these young

individuals play a pivotal role in shaping the world they will inherit (Finnegan, 2022). It is therefore crucial to consider children within sustainability science.

Rousell et al. (2017) identified a need for more "innovative and effective forms of climate change education" (p.192). However, most research until now has looked at children's existing scientific knowledge on the topic, which have shown to be incorrect, limited and highly influenced by mass media (Hickey-Moody et al., 2021; Rousell & Cutter-Mackenzie-Knowles, 2020), and research has shown that scientific knowledge-based approaches have been largely ineffectual in altering the attitudes and behaviors of children and young people towards climate change (Rousell & Cutter-Mackenzie-Knowles, 2020). Understanding children's emotional orientations towards the future is crucial as they are closely intertwined with climate narratives (Spyrou et al., 2022). Climate fiction have a direct link to emotions, affecting perceptions and potential actions towards climate change (Galafassi, Tàbara, et al., 2018). Research has shown that instilling constructive hope in children can positively impact their pro-environmental behavior (Ojala, 2012). Additionally, Ojala (2012) found that pessimism regarding climate change among youth was common, highlighting necessity of proactive efforts to understand these emotions and their sources. Despite its significance, limited research has explored the media's role in shaping children's relationship with climate change. Understanding how films influence the emotional landscape of children is vital in developing strategies that instill hope and inspire positive actions.

Furthermore, delving into climate futures through fiction offers a platform to depict diverse scenarios for a future climate and consider the implications of our actions. Envisioning and debating alternative paths is a crucial aspect of addressing the significant transformational challenges posed by climate change (Dobraszczyk, 2017; Milkoreit, 2017; Nikoleris et al., 2017).

This thesis significantly contributes to one of the core questions of sustainability science: "how can society most effectively guide or manage human-environmental systems toward a sustainability transition?" (Kates, 2011, p. 19450). By delving into children's films and exploring climate narratives and potential futures, this research actively engages with this fundamental question, providing insights that can guide actions for a more sustainable future.

1.5 Thesis Outline

After this introduction, I describe the rationale for choosing film as the primary medium of study and explore how climate change has been depicted in films thus far (Chapter 2). Next, I present the theoretical background of my study: climate imaginaries (Chapter 3). Thereafter, I outline the selection

criteria used to select the films studied and my methodological approach, which combines three methods of narrative analysis (Chapter 4). I then present my findings and analysis of RQ1 and RQ2 (Chapter 5). The next section (Section 6) includes a discussion of my findings and delves into RQ3, as well the limitations of my study. And finally, the conclusions are presented in Chapter 7.

2 Background

2.1 Climate Change in Cinema

In this section, I will explore the various ways in which climate change has been depicted in films and the rationale for choosing film as the primary medium of study.

2.1.1 Why Cinema?

Cinema plays a pivotal role in addressing the climate crisis, acting as a powerful medium with a wide reach to engage and inform audiences. It has the unique potential to inspire action and promote public awareness on a wide range of topics, including that of climate change (Giaccardi et al., 2022). Films have the capacity to convey specific stories, messages, perspectives, and values through various rhetorical and visual strategies (Manzo, 2017). One critical aspect of cinema's impact on climate change communication is its ability to weave narrative and emotional storylines (Sakellari, 2015).

These narratives can frame climate change as a moral and democratic issue, empowering people to address its impacts (Sakellari, 2015). This aligns with the idea that merely informing individuals about climate change is insufficient; they must also care, be motivated, and feel capable of taking action (Manzo, 2017).

It is essential to consider the role of emotions in climate change communication. Climate change films can provide new information and perspectives but may not always lead to sustained changes in behavior and attitudes (Sakellari, 2015). While fear-based messages can increase concern, they are generally seen as an ineffective tool for motivating engagement, and therefore should be accompanied by a sense of hope and agency, emphasizing that something can be done to address the problem (Milkoreit, 2019). Positive emotions play a crucial role in maintaining emotional engagement (Milkoreit, 2017; O'Neill & Nicholson-Cole, 2009). Ojala (2012) found a positive impact of constructive hope on young people's pro-environmental behavior, while denial-based hope showed a negative correlation.

This paper will concentrate solely on fictional films due to their ability to democratize imagination, thereby engaging and challenging larger audiences (Milkoreit, 2017; Molek-Kozakowska & Nicieja, 2020).

However, it is essential to acknowledge that fictional films aim to attract a broad audience, which often leads to ambiguous or cautious framing of issues and, at times, avoidance of controversial topics (Molek-Kozakowska & Nicieja, 2020). Films are inevitably influenced and constrained by the economic and discursive structures within which they operate (Benner et al., 2019). Despite media corporations presenting themselves as progressive, controversial topics only find their way into mainstream cinematic narratives once they are widely accepted (Molek-Kozakowska & Nicieja, 2020).

2.1.2 How has climate change been depicted in cinema?

According to a study by Giaccardi et al. (2022), climate change is "largely absent in scripted entertainment" (p.2). The study analyzed 37,453 TV and film scripts from 2016-2020 and found that only 2.8% of the scripts included any climate-related keywords, the most frequent being "climate change", "fracking", and "global warming". This study, however, only looked at implicit and direct references to climate change in TV and films. Similarly, Manzo (2017) also found that most published papers looking at climate change in cinema generally talked about direct mentions of climate change, stating that the three most talked about films in research were *The Day after Tomorrow* (2004), *An Inconvenient Truth* (2006), and *The Great Global Warming Swindle* (2007), the last two of which are documentaries.

Giaccardi et al's (2022) study, also found that there is an audience demand for more climate portrayals, where they seek fictional characters who share their level of concern about the climate. However, some of the largest films of the last few decades have referenced climate change in an implicit manner. *Figure 1* shows a list made by Svoboda (2020) of some climate change films from the last few decades. Although this list is unfinished and is in fact missing four of the films that this thesis will analyze, it shows that movies like *Avengers: End Game* (2019), *Interstellar* (2014), *Spiderman: Far From Home* (2019), and *Frozen II* (2019) all deal with climate change in one way or another, showing how climate change has infiltrated pop-culture.

Figure 1. List of Climate Fiction Films made by Svoboda (2020).

Even though climate change has become a larger part of contemporary discourse in recent years, the most ambitious climate films were released in the early 2000s, see *Figure 1*. The subsequent films have been neither as direct or sympathetic, and the most recent films "appear less willing to engage climate change explicitly" (Svoboda, 2016, p.59). Archer (2019) states that "inserting a random act of nature allows the filmmakers to forgo mention of climate change itself and hence avoid the wrath of the powerful climate-denial lobby and right-wing media" (p.12).

Additionally, Svoboda (2020) concluded that filmmakers have used seven different genres to adapt stories of climate change: *disaster movies, apocalypses, dystopias, psychological dramas, comedies, alien/superhero movies, and animated children's movies.* Disaster and Apocalypse films differ mostly by the ending, where life returns to normal after the crisis is resolved, whereas in an apocalypse film, characters must adapt to a changed world and significant changes in lifestyle occur. In a Dystopic film, "the civilization-ending (the-end-of-life-as-we-know-it) crisis has already occurred" (Svoboda, 2016, p.56). These three genres accounted for nearly 60% of all the films reviewed by Svoboda (2016). Additionally, Psychological Dramas delve into anxiety-driven narratives, while Comedies take on climate change is relatively infrequent, with the theme appearing more as a sidenote or in a satirical

manner. Some of the larger films representing topics of climate change have been within the genre of Alien/Superhero/Supervillain movies, where aliens have played different roles as either opportunists, colonist, or protectors of Earth (Svoboda, 2020; Townsend, n.d.).

Finally, the last genre filmmakers have used to explore climate change is Children's Animated films, which this paper focuses on. The first children's animated film that addressed climate change (though indirectly) was *FernGully: The Last Rainforest* (1992), which was screened in the opening of the Earth Summit that year.

Townsend (n.d.) identified several typologies of climate stories and concluded that one typology is missing: the "how we fixed it" stories. Svoboda (2016) also noted that of the 55 films he studied, only one offered a successful example of mitigation. Similarly, Dasilva (2019) examined Hollywood climate films, and found that the "present environmental imaginary of this cinematic space is increasingly dark and declinist" (p.2).

3 Theoretical Framework

3.1 Climate Imaginaries

In this section I will explain how the concept of climate imaginaries can help deepen our understanding of the futures depicted in the films.

Climate change is "characterized by its relationship to futures" (Yusoff & Gabrys, 2011, p.518). The discourse surrounding climate change is fundamentally predictive and future-oriented, where even empirically grounded reports from the Intergovernmental Panel on Climate Change are predictive and rely on our ability to imagine potential futures (Dobraszczyk, 2017; Yusoff & Gabrys, 2011). While scientists predict the future states of the planet using scenarios and models, creative practitioners envision potential future worlds. Collaboration between arts and humanities scholars and scientists offers the opportunity to "reconsider how climate futures are imagined, who is involved, and how these practices constitute future worlds" (Yusoff & Gabrys, 2011, p.518). Addressing climate change requires more than risk calculations; it demands creative thinking and imaginative approaches that challenge existing narratives (Yusoff & Gabrys, 2011).

Climate change presents significant transformational demands to society, requiring us to collectively engage in meaningful debates about realistic and desirable futures. Without this collective vision, societies lack the motivation and guidance for change (Milkoreit, 2017). Therefore, imaginaries play a

pivotal role in climate knowledge and action, providing "tools for envisioning not only alternative futures, but also ways of how to get there" (Benner et al., 2019, p.8). Thus, they are essential for motivating transformative change (Milkoreit, 2017).

However, humanity's struggle to effectively respond to climate change reveals a crisis of imagination, stemming from our inability to grasp the magnitude of climate change (Benner et al., 2019). This apparent failure of humanity to effectively respond to climate change shows the difficulty in creating shared, compelling visions of alternative futures capable of triggering profound societal changes (Milkoreit, 2017)

The concept of imaginaries is central to understanding societal responses to climate change (Davoudi & Machen, 2022). Climate imaginaries refer to collective visions of the future, encompassing beliefs, narratives, and shared understandings about the possible future climatic state of the planet (Milkoreit, 2017). They serve to simplify the complexity of social reality, providing orientation and direction for societies. These visions are dynamic, evolving over time, and may differ among societal groups based on their values and beliefs (Benner et al., 2019).

At its core, imaginaries refer to the cognitive processes through which human societies make sense of their environment and their place in the world (Levy & Spicer, 2013). A common approach to imaginaries in research has been through the concept of sociotechnical imaginaries (Jasanoff & Kim, 2009), which encompass the role of science and technology in creating futures. They are attainable futures, existing within specific temporal and cultural boundaries. Milkoreit (2017) highlights critical limitations within sociotechnical imaginaries and introduces the socio-climatic imaginary. The first limitation is that these tend to overlook the natural environment's role as a driver for social change. "Nature is not just a backdrop to social imagination and change; it actively shapes what can be and is imagined" (Milkoreit, 2017, p.3). To understand societal changes, adopting a coupled human-environmental systems perspective is imperative, emphasizing the interconnectedness of social and natural systems. The second limitation is that sociotechnical imaginaries only focus on desirable and attainable futures, while socio-climatic imaginaries include the entire spectrum of potential undesirable and unattainable scenarios. They encompass a broader range of future visions, from positive/desirable (utopian) to negative/undesirable (dystopian) possibilities. Milkoreit (2017) states the importance of understanding and exploring utopian versus dystopian thinking and its motivational effects on creating sustainability transformations. Therefore, to gain a more holistic understanding of complex issues like climate change, it is vital to consider not only the optimistic possibilities but also the challenges societies may confront.

3.1.1 Dominant Imaginaries

Over the past few decades, many competing imaginaries surrounding climate change have surfaced across scientific, social, and cultural domains. They encompass a wide spectrum, ranging from optimistic imaginaries envisioning a post-fossil fuel world with successful climate change mitigation to dystopian imaginaries depicting total climate breakdown and the collapse of civilization (Benner et al., 2019).

It is important to understand the role of the dominant imaginaries, since these tend to "suppress or marginalize alternative imaginaries and knowledges" (Benner et al., 2019, p.8). Furthermore, knowledge of these allow us to question the narratives around specific futures (Davoudi & Machen, 2022). Levy and Spicer (2013) argue that dominant imaginaries are linked to popular interests and new imaginaries often fail to capture the public imagination by not resonating with people's everyday lives and for failing to connect with viable business models on a large enough scale. In their study, they identified four major dominant imaginaries in climate change narratives: fossil-fuels forever, techno-market ('green tech'), sustainable lifestyles, and climate apocalypse. Levy and Spicer (2013) use *Figure 2* to visualize these imaginaries, looking at two main variables – how resilient or fragile the narratives consider the natural environment to be and the degree of commitment to the present economic/social/political system.
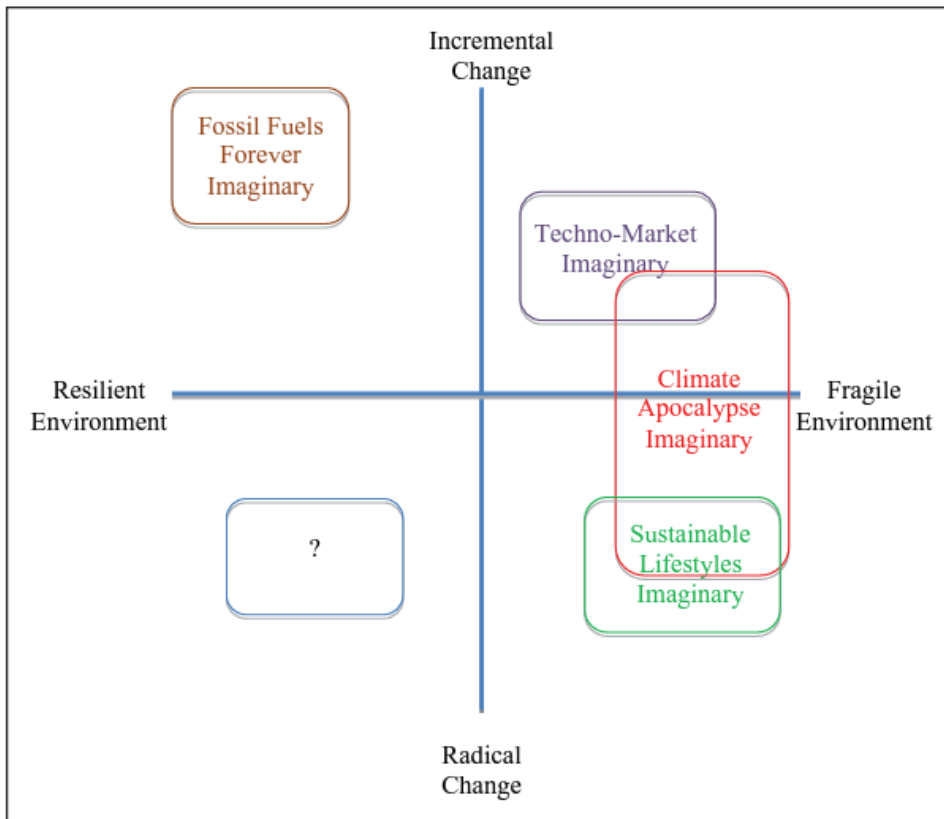
Figure 2. Levy and Spicer's (2013) framework for visualizing the four dominant narratives.

The *Fossil Fuels Forever* imaginary assumes a bountiful supply of fossil fuels, with technological advancements facilitating their extraction and usage. This perspective downplays the environmental risks of climate change and aligns with the belief that little to no change is needed in lifestyle or to the current economic system.

Contrastingly, the *Sustainable Lifestyles* imaginary posits that the environment is highly fragile, demanding substantial changes in the economic system to achieve sustainability. It advocates for a shift towards simpler, less materialistic lifestyles, promoting sustainable consumption and stronger community bonds. However, its anti-capitalist nature and deviation from mainstream systems pose challenges to its widespread adoption, and thus continues to be a niche imaginary.

The *Techno-Market* imaginary strikes a balance by advocating for climate action without major lifestyle disruptions. It relies on the advancement of clean energy technologies and market-based solutions, while still allowing for continued economic growth. It sees the environment as somewhat vulnerable but still manageable with the right economic and technological innovations. This imaginary holds a hegemonic appeal because "it promises to reconcile the tensions between climate change and functioning economic system" (Levy & Spicer, 2013, p.665).

The *Climate Apocalypse* imaginary portrays a grim future with dire climatic consequences resulting from human activities. Despite highlighting the extreme fragility of nature, the changes in lifestyle promoted by this narrative are, surprisingly, "more incremental, and some would argue, pragmatic rather than the radical shifts advocated by the *Sustainable Lifestyles* imaginary" (Levy & Spicer, 2013, p.666). Whenever one encounters discussions about contemporary climate change narratives, one word that is likely to appear is 'crisis' (Meifert-Menhard, 2020). This crisis-oriented perspective fuels the dominance of the *Climate Apocalypse* imaginary, capturing widespread attention and shaping public understanding of climate futures.

Finally, there is no dominant narrative within the third quadrant that combines belief in environmental resilience and the need for radical change. This quadrant's assumption appears "somewhat contradictory", and could perhaps belong to non-green socialists, who want radical change but not for environmental reasons. (Levy & Spicer, 2013)

Understanding these dominant imaginaries allows for a more comprehensive examination of how they influence public perception of climate change and how these in turn may be reflected within the media children are exposed to.

3.1.2 Imaginaries and Climate Fiction

There is a growing body of research in this area that focuses on climate fiction, sometimes also called speculative fiction (Milkoreit, 2017; Yusoff & Gabrys, 2011). Climate fiction has established itself as a potent tool that helps shape how we perceive and respond to climate change. Yusoff and Gabrys (2011) emphasize that it is more than just a creative realm—it actively co-creates our understanding of climate change, offering a platform to envisage alternative paths for adaptation and mitigation (Nikoleris et al., 2017; Whiteley et al., 2016).

Climate fiction holds the power to humanize the abstract notion of climate change, and transforms data into tangible experiences, engaging our senses and emotions (Galafassi, Tàbara, et al., 2018; Milkoreit, 2017). Fiction can show solutions that do not necessarily fit into a specific framework, allowing viewers to imagine futures that are completely different from what they have previously envisioned (Nikoleris et al., 2017). While fiction may not directly alter the world, it does provide a conceptual infrastructure for diverse imaginaries to coexist and which could potentially trigger new forms of action (Benner et al., 2019).

According to Yusoff & Gabrys (2011), the Climate Apocalypse imaginary has dominated climate fiction, particularly the idea of 'survivalism' (Dasilva, 2019). This imaginary often gains traction in popular

culture due to its alarming depiction of potential climate-related catastrophes, and has been popularized in films like *The Day After Tomorrow* (Levy & Spicer, 2013).

Levy & Spicer (2013) note that although the techno-market imaginary is popular among elites, it has not widely permeated pop-culture, although Dasilva (2019) states that he found a degree of 'techno-optimism' in Hollywood speculative fiction.

4 Methodology

The theory presented above presents a conceptual framework for assessing climate change and climate future depictions in children's animated films. In the following section, I will first describe my selection criteria and present the chosen films of study. Second, I will explain the reasoning behind selecting a narrative analysis to analyze the films, and third, I will present the three specific narrative methods chosen.

4.1 Selection Criteria

To select the films for this study, I came up with a set of criteria the films had to meet:

- The films had to fall under the category of children's animated films.
- To ensure their relevant/current nature, the films had to be released within the past decade (2013 to 2023).
- The narratives presented should be fictional.
- The films must address climate change issues, either directly or indirectly.

To identify films that fit these criteria, I used a combination of *Google* and *IMDb*'s search functions, using a number of search terms, which are listed in *Table 1*. For each search term, I examined every link in the first two pages of the Google results, and every result on IMDb. This entailed identifying all potentially relevant films, even if they were not explicitly associated with climate change but pertained to other environmental themes. Once a comprehensive list was compiled, I employed a more meticulous screening process, where I read detailed synopses of the films to exclude irrelevant options. If I still had any doubts about the film's relevance to my study, I watched the film to better assess its suitability.

Table 1. The search terms used to select the films for this study.

Search Terms Used in Google Search:
animated movies + climate change
animated movies + global warming
movies + climate change
movies + global warming
cli-fi movies
Search Terms Used in IMDb:
climate change; global warming;
environmentalism

Consequently, I identified six films that aligned with the study's objectives presented in *Table 2*. These showcase a relatively diverse and international assortment, albeit with a more predominant Western influence.

Table 2. An overview of the six films chosen for the study, along with their respective release years and countries of production.

FILMS SELECTED	YEAR	COUNTRY(IES) OF PRODUCTION
Arctic Dogs	2019	Canada/USA
Axel 2: Adventures of the Spacekids	2017	China
Deep	2017	Spain/Belgium/Switzerland
Frozen 2	2019	USA
Strange World	2022	USA
Weathering With You	2019	Japan

4.2 Narrative Analysis: Theory

To analyze the films, I chose to take a narrative methods approach. Narrative research pertains to the investigation and analysis of materials with narrative content (e.g. films, books, policy documents, interviews, etc.) (Lieblich et al., 1998). In the realm of social sciences, the terms "story" and "narrative" are frequently used interchangeably (Riessman, 2008), as a story constitutes a specific form of narrative encompassing not only sequential and temporal ordering, but also some kind of rupture or disturbance in the normal course of events that provokes some sort of reaction (Riessman, 2008, p.3). Both narratives and stories require the deliberate linkage of events or ideas in meaningful patterns (Riessman, 2008). For the sake of clarity, this study focuses on stories, hence the terms "story" and "narrative" are employed interchangeably.

Narratives are everywhere. People are storytellers by nature and narratives can be traced throughout the entirety of human history, spanning across cultures and societies (Riessman, 2008). Moreover,

"stories imitate life and present an inner reality to the outside world" (Lieblich et al., 1998, p. 7)*,* and are important in providing coherence to one's experiences, while playing a pivotal role in our communication with others*.*

Additionally, narrative research is inherently interpretive, meaning that a single "correct" interpretation or reading of a text does not exist. The interpretation of a narrative is invariably "personal, partial, and dynamic", embodying principles of "pluralism, relativism, and subjectivity" (Lieblich et al., 1998, p. 2). Consequently, researchers bear the responsibility of presenting systematic and coherent justifications for their chosen methodologies (Lieblich et al., 1998).

4.3 Narrative Analysis: Methods

In order to address my research questions, I opted for a mixed and interdisciplinary approach within narrative research to ensure I selected the most appropriate methods for each specific question, which I illustrate in *Figure 3*. **RQ1** requires a closer look at and interpretation of both the explicit and implicit content of the films (the "what" of the story), which I will address through the application of a Qualitative Content Analysis. **RQ2** is broken down into: *how* these narratives are constructed, and *who* creates them and for whom. To interpret the *how*, I will use a Narrative Structure Analysis, which examines elements like narrative structure and plot (including the use of time and space). To analyze the *who* part of **RQ2**, I will use a simplified version of Hogan's (2013) Narrative Discourse Analysis framework, that looks at the different voices and people involved in a story.
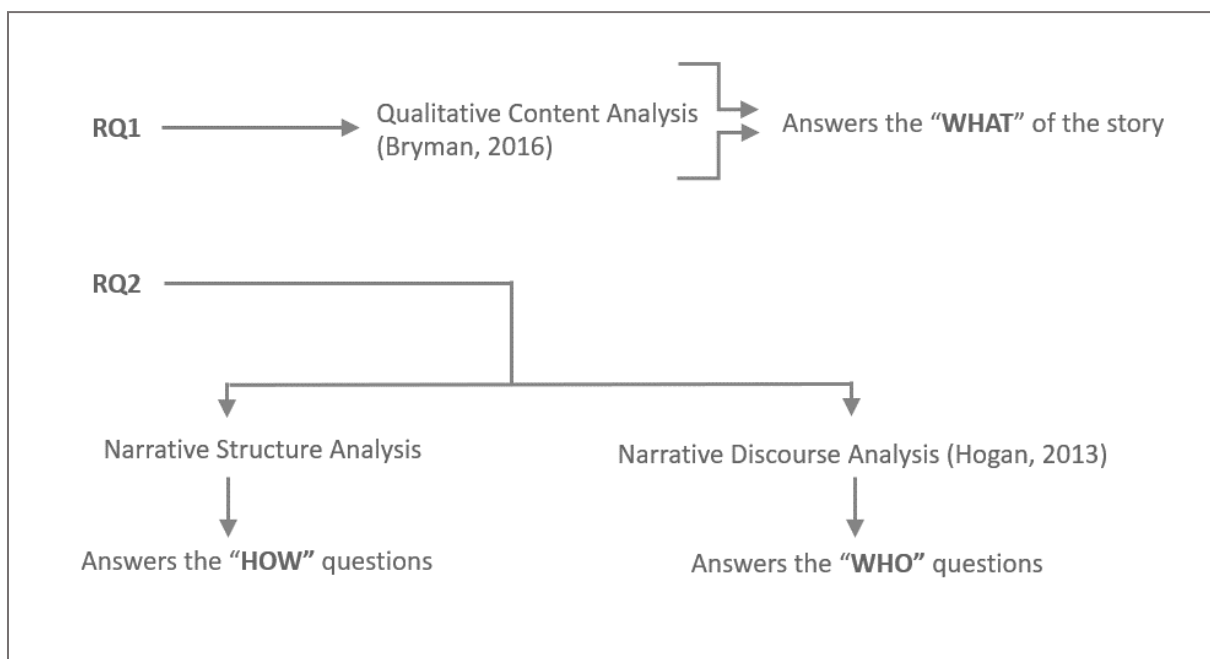
Figure 3. An overview of the narrative methodologies selected for addressing the first two research questions of this paper.

RQ3 will be answered in the discussion section of the paper, based on the findings to **RQ1** and **RQ2**.

4.3.1 Qualitative Content Analysis

One can approach content analysis from either a quantitative or qualitative nature. Quantitative content analysis (QCA) requires systematic and predefined categories and is not particularly conducive when seeking out latent meaning and themes (Bryman, 2016, p.307).

Therefore, a QCA was selected to answer **RQ1** since it allowed me to explore *what* is being said and shown in the films. A qualitative approach offers more flexibility, and although it employs some initial categorization, the method allows for revision and refinement of categories throughout the research which was optimal for decoding **RQ1**. It specifically seeks out underlying themes and implicit content within texts while upholding the significance of each text's contextual background (Bryman, 2016). QCA looks at the narrative as a whole, interpreting every text segment within the broader context of the narrative (Lieblich et al., 1998). It also emphasizes the investigator's active role in constructing meaning from the data (Bryman, 2016). However, this does not grant absolute freedom for speculation and intuition; rather, interpretative decisions should be well-justified (Lieblich et al., 1998).

Qualitative Content Analysis: Data Collection

I applied the QCA to the six selected films in the following manner.

Upon initial film viewing and following my background and theoretical research for this study, I formulated a set of preliminary categories to explore within each film. A large list of themes of interest were initially identified. With the intention of maintaining a systematic yet more flexible approach, these themes were grouped into broader categories that were established in the form of questions. The overarching categories/questions were left open-ended to facilitate the emergence of new topics (or even the exclusion of some themes) during the analysis. *Figure 5* shows an example of four of the broader guiding questions, and some examples of possible themes to help guide the research.

Figure 4. An example of the overarching questions (black) and the accompanying guiding subthemes (red) used for the qualitative content analysis of each film. The full list of questions and themes can be found in the Appendix.

To address these questions, I viewed each film at least three times. The initial viewing took place prior to the creation of the categories, during which I aimed to watch the film as naturally and as closely as intended by the filmmakers as possible, thus intentionally trying to avoid analyzing the films. In the second and third viewings, I took on an analytical approach, with a focus on identifying crucial themes. Additionally, I created a comprehensive document for each film, outlining explanations and/or dialogues of pertinent scenes, as well as noting the time these scenes unfolded. This document served a dual purpose: it helped me during the analytical process, and it also made it easier for me to retrieve pertinent moments during analysis. After these viewings, I was able to answer each of the questions of the content analysis for each individual film.

4.3.2 Narrative Structure Analysis

By only paying attention to 'content' and not 'form', "an important source of information may be lost" (Lieblich et al., 1998, p. 126), since the formal aspects of structure can also provide important insights into the identity, perceptions, and values of the storyteller. Thus, I employed a narrative structure analysis, a method frequently utilized in film studies, with the aim to address the "how" question (the first focus of **RQ2**).

Such an analysis begins by observing the different story elements. First, I look at how the story moved forward, whether there were elements such as an exposition, rising action, climax, resolution, etc. Then I will identify how the film utilized time, including elements like linearity/non-linearity, flashbacks, time jumps, montages, and the general pacing of the film. Additionally, I look at the relevance of space and setting, as well as scale. ('Film Analysis', n.d.; Long et al., 2020).

4.3.3 Narrative Discourse Analysis

The next part of the analysis of the films looks at the *who* – who is speaking to whom, both inside and outside of the text. This section applies a simplified version of Hogan's (2013) Narrative Discourse Analysis framework. His framework looks at *how* the story is transmitted by way of the *who'*– who is writing/telling the story, who is reading/viewing it, who is the narrator and who are they directing their thoughts to, etc. His original framework, however, goes more in depth than is possible for the scope of this paper and what is necessary to answer **RQ2**.

Thus, the simplified version is as following:

<u>Real author [narrator[narratee]implied reader] Real reader/viewer</u>

In this framework, the *real author* and the *real reader* are outside of the square brackets, meaning that they are outside the bounds of the textual world. The *real author* refers to the person or persons who wrote/composed the narrative. *Real readers/viewers* refer to the actual individuals who engage with a narrative by emotionally connecting and responding to its elements. *Real readers* go beyond the text's literal statements, filling in perceptual and emotional details, oftentimes personally experiencing emotions themselves. In this study, the *real reader/viewer* is me, the researcher. (Hogan, 2013)

Conversely, the *implied reader* is an abstract construct within the textual realm, arising from the text itself (Hogan, 2013). It embodies the author's envisioned recipient, or the "*presumed addressee* to whom the work is directed and whose linguistic codes, ideological norms, and aesthetic ideas must be taken into account if the work is to be understood"(*Implied Reader | the Living Handbook of Narratology*, n.d., p.1) In this case, the *implied reader* would be the target audience – children and sometimes their families. The *real reader* must not necessarily feel what the *implied reader* 'feels', but the *real reader* should understand from the context of the text what they should be feeling.

The next level is the *narrator*, who is clearly within the story. They are the voice or the point of view/perspective of the story. The *narratee* is the counterpart of the *narrator* - it is who the *narrator* is addressing within the story. (Hogan, 2013)

The analysis of each of these five *who's* was done for every film. Although the analysis looked at *narrator* and *narratee*, not much useful data came out from this perspective, and thus will not be considered in the analysis.

5 Analysis

This section will go over the results and analysis of the first two research questions. It will begin with a short overview and introduction of the six films analyzed, and then will move on to exploring the results.

To facilitate the reading of this paper, the following two tables give the reader more context for each of the films analyzed. The films fall between the years 2017-2022. One film is produced in Canada/USA, China, Europe (Spain, Belgium, and Switzerland) and another in Japan whilst two films produced in the USA, see *Table 3*. The two selected from the USA are both produced by *Disney*. Two of the films are sequels (*Frozen II* and *Axel 2*), and although some nuances may be missed, it is not necessary to have seen the first film in either case to understand the movies. Furthermore, the films range quite drastically in box office earnings, varying between USD$7.8 million (*Axel 2*) to USD$1.45 billion (*Frozen II*). (*Axel 2: Adventures of the Spacekids*, n.d.; *Frozen II*, n.d.)

Additionally, *Table 4* includes a short synopsis of each film to help readers who have not seen the films follow the analysis more easily.

Table 3. Relevant background information and context about all six movies of the study.

Film	Year	PG Rating	Ratings	Genre	Original Language	Production Countries	Studios	Writers and Directors	Box office	Other important context
Arctic Dogs (Also known as Arctic Justice internationally or Polar Squad in the UK) (*IMDB.com*, 2019a)	2019	PG	**IMDb** 4.8/10; **Rotten Tomatoes** 12%	Animation/ Comedy/ Adventure	**English**	**Canada and USA**	**Production**: AMBI Media Group, AIC Studios, Assemblage Entertainment **Distribution**: Entertainment Studio Motion Pictures	**Director**: Aaron Woodley (Canada); **Writers**: Bob Barlen (Canada), Cal Brunker (Canada), Matthew Lyon (Created By) (Canada), Bryan Thompson (Contributing Writer) (Canada), Aaron Woodley (Canada)	**Gross worldwide:** USD$9.87 million / It was a box-office bomb, grossing less than a fifth of its production budget of $50 million. (*Arctic dogs*, n.d.)	The film stars the voices of Jeremy Renner, Heidi Klum, James Franco, John Cleese, Omar Sy, Michael Madsen, Laurie Holden, Anjelica Huston, and Alec Baldwin.
Axel 2: Adventures of the Spacekids (Also known as: Finding Callaro and Mission: Galaxy) (*IMDB.com*, 2017)	2017	PG	**IMDb** 4.4/10; Not available on Rotten Tomatoes	Animation/ Adventure/ Sci-fi	**Chinese and English**	**China**	**Production**: Versatile MediaParticular Crowd	**Director and writer:** Leo Lee (Chinese)	Gross worldwide: USD$7.8 million (*Axel 2: Adventures of the Spacekids*, n.d.)	The film is a sequel. The first movie is called Axel: The Biggest Little Hero and came out in 2013, but it is not about climate change or about the destruction of planet. The first film not necessary to understand second.
Deep (*IMDB.com*, 2018)	2017	PG	**IMDb** 4.2/10; **Rotten Tomatoes** 33%	Animation/ Adventure/ Comedy	**English**	**Spain, Belgium, and Switzerland**	**Production**: The Thinklab, Umedia, Grid Animation, Silver Reel, Kraken Films **Distributed**: Lionsgate	**Director**: Julio Soto Gurpide (Spain); **Writers**: Julio Soto Gurpide (Spain), Jose Tatay (Spain), Salva Rubio (Spain)	Gross worldwide: USD$10.9 million (*Deep*, n.d.)	
Frozen II (*IMDB.com*, 2019b)	2019	PG	**IMDb:** 6.8/10; **Rotten tomatoes** 77%	Animation/ Adventure/ Comedy/ Drama/ Family Fantasy/ Musical	**English**	**USA**	**Production**: Walt Disney Animation Studios **Distribution**: Walt Disney Studios Motion Pictures	**Directors**: Chris Buck (USA) and Jennifer Lee (USA); **Writers**: Jennifer Lee, Chris Buck, Marc Smith (USA), Kristen Anderson-Lopez (songwriter and lyricist) (USA), and Robert Lopez (songwriter and lyricist) (USA); The story is lightly inspired by "The Snow Queen" by Hans Christian Anderson (a Danish fairy tale)	**Gross worldwide:** USD $1.453 billion / It is the highest grossing animated film of all time / 13th highest grossing film. (*Frozen II*, n.d.; *Top Lifetime Grosses*, n.d.)	The film is a sequel; It is not necessary to see the first film to understand this one, but it helps to understand the characters and their actions. It stars the voices of Kristen Bell, Idina Menzel, Josh Gad, and Jonathan Groff.
Strange World (*IMDB.com*, 2022)	2022	PG	**IMDb**: 5.7/10 ; **Rotten Tomatoes** 72%	Animation/ Action/ Adventure/ Comedy/ Family/ Fantasy/ Sci-fi	**English**	**USA**	**Production**: Walt Disney Animation Studios **Distribution**: Walt Disney Studios Motion Pictures	**Directors**: Don Hall (USA) and Qui Nguyen (USA) **Writer**: Qui Nguyen (USA)	**Gross worldwide:** USD$73.6 million / The film was a box-office bomb, with losses to Disney of about $197 million, but it was a streaming hit on Disney+ . Many recent Disney films have lost money post-pandemic, including Encanto and Lightyear. (Rubin, 2022; *Strange world*, n.d.)	The film stars the voices of Jake Gyllenhaal, Dennis Quaid, Jaboukie Young-White, Gabrielle Union, and Lucy Liu.
Weathering With You (Also known as Child of Weather, a literal translation of the Japanese title) (*IMDB.com*, 2020)	2019	PG-13 the film in Japan has no age rating	**IMBD** 7.5/10; **Rotten Tomatoes** 92%	Animation/ Fantasy/ Romance/ Drama	**Japanese** (I watched the English dubbed version)	**Japan**	**Production**: CoMix Wave Films **Distribution**: Toho	**Director and writer:** Makoto Shinkai (Japan)	**Gross worldwide:** USD$192.9 million / The highest grossing Japanese film of 2019 and the seventh highest-grossing anime film of all time (*Weathering with you*, n.d.)	It features the voices of Kotaro Daigo and Nana Mori.

Table 4. A synopsis of each of the six analyzed films.

FILM	Summary of Film
Arctic Dogs	"Swifty the Arctic fox works in the mail room of the Arctic Blast Delivery Service but dreams of one day becoming a Top Dog (the Arctic's star husky couriers). To prove himself worthy of the Top Dog role, Swifty secretly commandeers one of the sleds and delivers a package to a mysterious location. He stumbles upon a secret fortress where he comes face to face with Otto Von Walrus, a blubbery evil genius who walks around on mechanical legs and commands a loyal army of oddly polite puffin henchmen. Swifty soon discovers Von Walrus' plan to melt the polar ice caps and flood the world in order to reign supreme. Now, Swifty has to enlist the help of his friends: PB, a concerned polar bear, Lemmy, a scatterbrained albatross, Bertha and Leopold, two conspiracy theorist otters and Jade, a worldly fox. This ragtag group of Arctic misfits has to band together to stop Von Walrus' sinister plans and save the day." (*Arctic Dogs*, n.d.-a)
Axel 2: Adventures of the Spacekids	"Wall-E meets Avatar in this outer space adventure. The once beautiful Planet Kepler is near destruction after its Carlalo plant was exploited to extinction by Earthers using it as a source of super energy. Brave Axel, Jono and Gaga battle against evil Earthers, giant spaceships and destructive Robots and the trio of heroic milky-way troopers will stop at nothing to alter the fate of their home." (*Mission: Galaxy - Apple TV*, 2017)
Deep	"In 2100, when humanity has abandoned the Earth, a colony of extravagant creatures still thrives in the deepest abyss of the ocean. Deep, an adventurous "dumbo" octopus and the last one of his kind lives there with his two unconditional friends: Evo, a nerdy and clumsy angler fish, and Alice, a neurotic deep-sea shrimp. When an accident destroys their home, the guardian of the abyss, The Kraken, will send Deep and his friends on a perilous journey to find a new home. In their mission, they will be joined by Maura -a voracious moray eel- and together they will travel to amazing places like the submerged city of New York, the Titanic or the Arctic, facing formidable enemies and hilarious situations. Will they be able to bring the oceans back to their former glory?" (*IMDB.com*, 2018)
Frozen II	"Having harnessed her ever-growing power after lifting the dreadful curse of the eternal winter in Frozen (2013), the beautiful conjurer of snow and ice, Queen Elsa, now rules the peaceful kingdom of Arendelle, enjoying a happy life with her sister, Princess Anna. However, a melodious voice that only Elsa can hear keeps her awake, inviting her to the mystical enchanted forest that the sisters' father told them about a long time ago. Now, unable to block the thrilling call of the secret siren, Elsa, along with Anna, Kristoff, Olaf, and Sven summons up the courage to follow the voice into the unknown, intent on finding answers in the perpetually misty realm in the woods. More and more, an inexplicable imbalance is hurting not only her kingdom but also the neighbouring tribe of Northuldra. Can Queen Elsa put her legendary magical skills to good use to restore peace and stability?" (*IMDB.com*, 2019b)
Strange World	"The film follows a legendary family of explorers, the Clades, who must set aside their differences as they embark on a journey to a mysterious subterranean land inhabited by surreal lifeforms, in order to save a miracle plant Pando that is their society's source of energy" (*Wikimedia Foundation*, 2023). Things are not how they seem, however, and it appears that Pando is in fact killing the world they live in. Will they be able to sacrifice Pando to save the world in time?
Weathering With You	"Tokyo is currently experiencing rain showers that seem to disrupt the usual pace of everyone living there to no end. Amidst this seemingly eternal downpour arrives the runaway high school student Hodaka Morishima, who struggles to financially support himself—ending up with a job at a small-time publisher. At the same time, the orphaned Hina Amano also strives to find work to sustain herself and her younger brother. Both fates intertwine when Hodaka attempts to rescue Hina from shady men, deciding to run away together. Subsequently, Hodaka discovers that Hina has a strange yet astounding power: the ability to call out the sun whenever she prays for it. With Tokyo's unusual weather in mind, Hodaka sees the potential of this ability. He suggests that Hina should become a "sunshine girl"—someone who will clear the sky for people when they need it the most. Things begin looking up for them at first. However, it is common knowledge that power always comes with a hefty price..." (*Tenki No Ko*, n.d.)

5.1 Who is involved in these films?

This analysis section will begin by answering the *who* of **RQ2** – who is engaged in and with these films. The reason for answering out of order is that this question provides important contextual background. I will then shift focus to **RQ1**, exploring the *what* inquiries, intertwined with an exploration of the *how* from **RQ2**.

Real author

Analyzing film authors proves challenging due to the extensive involvement of numerous individuals in their creation. To simplify, I focused on writers and directors as the real authors, since they have a pivotal role in the narrative's direction. *Weathering With You* (WWY) presented a clearer authorship due to the *auteur* status achieved by notable anime filmmakers in Japan like Makoto Shinkai, often dubbed the "new Miyazaki"(Carlo, 2020). Of the six studied films, Frozen II was the only one with women as co-directors and co-writers. This gender imbalance is reflective of broader issues in the film industry (Fuster, 2022), emphasizing the need for improved representation in top creative roles. Although I will not delve deeper into the importance of representation in media and the sciences, it is important to realize that all these stories are being made by men for children.

While writers and directors significantly influence narratives, they are part of a collaborative effort with many contributing voices. For instance, in Frozen II, consultation with a Sámi working group inspired the representation of the indigenous community (*Frozen 2 and Sámi Culture*, n.d.). Moreover, it is vital to recognize that directors and writers are also influenced by studio constraints and funding dynamics, potentially limiting creative freedom (Milkoreit, 2017).

Implied reader

Shifting the focus to the implied reader/viewer, the films vary in their target audience. *WWY* stands out for being primarily aimed at teens due to its intricate themes and ethical nuances. It is the only film labeled PG-13. In contrast, *Axel 2, Deep*, and *Arctic Dogs* are meant for younger children (around 5 to 7 years old) with simpler characters, dialogues, and storylines. *Frozen II* and *Strange World*, are suitable for a wider age range and fall into the family film category with more complex plots, allowing both children and parents to engage. However, *Frozen II*, with its focus on sisterly bonds and its association with Disney princesses, tends to be perceived as a film for younger girls.

Real reader/viewer

This part of Hogan's (2013) framework allowed me to look at my positionality in the research.

I was the real viewer of these films - an adult without children, not the target audience. However, due to my personal enjoyment of the genre, I had seen *Frozen II* and *Strange World* prior to this study. Nevertheless, movies like *Deep, Arctic Dogs*, and *Axel 2* posed a challenge for me, as they are directed at very young audiences, offering little entertainment value for adults. The characters lacked depth, making it difficult to emotionally connect with them, though I could still discern the intended emotional cues.

On the contrary, *Frozen II* and *Strange World* were highly enjoyable, and subsequent viewings enhanced my appreciation due to the nuanced details not immediately apparent. I could empathize intensely with the characters, especially through the songs in *Frozen II*. *WWY* presented a unique challenge. As a white Western woman primarily exposed to Western media, the film's slower pace and intricate themes proved difficult to navigate, and I felt that I needed the three viewings simply to understand the film. Although the main storyline is accessible and meant for teens, some of the themes felt to me to be more geared towards adults. I aligned more closely with the implied reader for this film, and felt the 'right' emotions, although certain cultural subtleties may have been lost on me and in translation, given that it was the only film I watched dubbed, whereas the others were originally in English.

5.2 Climate Change Narratives

5.2.1 How is climate change depicted?

Moving on, this section will look at the climate change narratives found in the films, answering **RQ1** and the *how* part of **RQ2**. The analysis examined various topics, and I will describe some of the more interesting and important findings by diving them into themes.

Climate change – Direct, implicit or metaphor?

The first thing I looked at in my analysis was whether the films referred to directly, implicitly, or metaphorically to climate change to see how climate change was being represented in these films.

The films vary in their approach to depicting climate change. *Arctic Dogs* is the only film directly referring to the topic, using the term global warming. In this film, the arctic is under threat of increasing temperatures due to the release of 'BAD-gas' beneath the ice. In contrast, *Deep* and *WWY* unmistakably depict the effects of climate change, but do not explicitly mention it. Both seem to actively avoid using the word, although *WWY* uses less mainstream terms like 'Gaia Theory' and the

'Anthropocene' to suggest the topic, but these are not terms commonly known by children. These three films are the only ones that take place on Earth.

Axel 2 takes place on a fictional planet in our universe, whilst *Strange World* and *Frozen II* take place in completely fictional worlds. These films use metaphorical representations of climate change, drawing parallels between their fictional worlds and Earth's climate issues. The metaphor in *Axel 2* and *Strange World* is clearer than in *Frozen II*. The climate metaphor in *Axel 2* can be seen in two ways– the first is that the planet Keplar serves as a parallel of Earth – a planet transformed from a green utopia into a desert wasteland due to human greed. The second way can be seen from a colonial perspective, where humans of the future externalize Earth's energy problem by conquering and extracting energy and resources from other planets. *Strange World* also deals with energy as the cause of destruction of the world – closely mirroring the relationship between fossil fuels and the current climate crisis. In this film, however, the effects do not alter the weather, like in all previous four films, but instead threaten the existence of life in their world. Nevertheless, it serves as a clear metaphor for climate change and the 'destruction' of our own planet. Finally*, Frozen II*'s climate metaphor is the most subtle of the six films. Although the metaphor is vague, the connection between greed and environmental destruction is very clear.

<u>*Scale and urgency of climate change*</u>

Climate change is complex and hard for humans to fully grasp or represent accurately due to its large scale in both temporal and spatial terms (Meifert-Menhard, 2020). In four of the six films (*WWY, Strange World, Axel 2,* and *Deep*), an interesting approach by filmmakers was to show audiences a view of the planet from space, emphasizing the global nature of the issue. In *WWY*, we never hear about climate changing outside of Japan, yet the filmmakers actively chose to zoom the 'camera' out to a view of Japan and then of the entire world from space. This shift to a cosmic perspective "can be powerful incentive for taking better care of earth, which remains the only viable home for humanity" (Leichenko & O'Brien, 2019, p.72).

In *Arctic Dogs*, climate change is depicted primarily on a local scale, with occasional global references, like a "sudden spike in global temperatures" (Woodley, 2019, 00:07:22) mentioned on the radio. Conversely, *Frozen II* confines climate change concerns to the kingdom of Arendelle and the Enchanted Forest, not addressing broader global implications. The film delves into local climate justice issues, elaborated in the next section.

In terms of urgency, in half of the films *(Arctic Dogs, Strange World, and Frozen II)*, the problem of climate change appears quickly and out of nowhere and threatens the characters' world and way of

life. This is met with a call to adventure to immediately fix the problem and save the world in a matter of days. Additionally, in the first two films, the problem is resolved at the very last minute. *WWY*, however, has a very different approach to the urgency and pacing of climate change – it shows it as a slow, constant, and less dramatic process on a larger temporal scale (in a matter of three years), which remains a short time scale in climate change terms but much longer in comparison. In *Deep* and *Axel 2*, the urgency is not related to climate change since it has already happened in these post-apocalyptic worlds – but there is an urgency by the characters to restore their worlds.

To show audiences the scale of the problems and solutions, all filmmakers utilized similar narrative tools, which brings me to one of the bigger takeaways from the Narrative Structure Analysis. All films showed audiences a 'before' and an 'after', and most showed us the past, the present, and then the changed future. *Deep* stands out as the only film lacking a time jump to exhibit the outcomes of their efforts to restore the ocean, leaving viewers hopeful but unsure of their future success. In all the futures, life has either reverted to a sense of normalcy or has undergone changes that are not detrimental. These strategic time jumps enable creators to illustrate the progression of events over time, emphasizing that not all aspects of the story unfold immediately, while still maintaining an easy-to-understand linear time structure. In *Strange World*, for example, saving the world was an immediate and hurried adventure, but the time jump reveals that there is still work to do even a year later, showing us Ethan, the main protagonist, leading a cleanup crew of the leftovers of Pando (the plant and energy source that threatened the world).

Who is to blame? – Villain or no villain

Children's stories are known to have a villain that helps drive the plot. They are an easy way of allowing children to understand the concept of good and bad (Reynolds, 2011).

Surprisingly enough, four of the films have no active villain driving the action, paralleling the fact that climate change is a "catastrophe without a villain [and that in a way] we are all responsible for the detrimental changes to both our immediate and global environment" (Molek-Kozakowska & Nicieja, 2020, p.57). Although *Strange World* and *WWY*, have no major villains, the films both put responsibility on the protagonists to fix the problems, but do not place blame on anyone. Moreover, *Frozen II* and *Deep* also have no active villain in the story, but instead, the blame is put on previous generations. Similarly, *Axel 2* blames greedy 'Earthers' of the past for the destruction of their planet, but also has an active villain who continues to threaten the planet. In *Deep*, humans of the past destroyed Earth. Although humans "were totally to blame for like everything that happened"(Gurpide, 2018, 00:00:45), they are depicted as stupid rather than evil. When the protagonists swim through a sunken New York

they say: "wow, they really wrecked this place […] why would you make all this stuff and then destroy it?"[…]"Yeh, I thought they were supposed to be smart!"(Gurpide, 2018, 00:36:15). In *Frozen II*, the environmental problems are blamed on a villain from the past, the protagonists' grandfather. Because of his greed for power, he purposefully built a dam to weaken the river to make the indigenous people dependent on his rule.

Arctic Dogs takes a different approach where there is an active villain who is purposefully causing climate change - weaponizing climate for revenge and power.

Who suffers? – Generational injustices, climate justice, and colonialism

Furthermore, my analysis looked at who was suffering the consequences of climate change in the stories.

One interesting finding was that every movie except *Arctic Dogs* mentioned generational injustices related to climate change. In *Axel 2* and *Deep*, the youth are made to grow up in a changed world, where they cannot live freely and safely like the previous generations. In *Axel 2*, the young protagonists have grown up in a desert wasteland, never having seen plant life nor lakes. When they find the hidden cave full of plant life and water, they are in absolute awe of its beauty, and at the end of the film when it finally rains, we discover that the youngest protagonist has "never seen rain in [his] entire life"(Lee, 2017, 01:15:46). Similarly, in *Frozen II,* there is an entire generation of indigenous people born after the forest fell into mist who have never left the forest or seen clear skies. Additionally, the protagonists are forced to right the wrongs of the past, even though they were not the ones who caused the problem. In *Strange World*, the older generations are obsessed with leaving their mark in the world, and Ethan teaches us at the end of the film that "the best legacy we can leave is making a present that we can open tomorrow"(Hall & Nguyen, 2022, 01:26:56), emphasizing the importance of leaving the world in good conditions for future generations.

Apart from dealing with injustices from people of the past, where the youth must step up to fix it, *Deep, Axel 2* and *Frozen II* also deal with issues of climate justice, where it is not those responsible for climate change who suffer its effects the most. In *Deep*, the remaining sea creatures that survived had to migrate from their homes and adapt to harsh conditions and a new way life. In *Frozen II*, the indigenous people who were not the ones responsible for what happened were the ones who suffered, while the people of Arendelle continued to thrive for 30 years, unaware of the injustice. *Frozen II* and *Axel 2* both link environmental destruction to colonialism. *Frozen II* deals with colonial conquests and injustices towards indigenous peoples, while *Axel 2* deals with space colonialism – where humans have

turned to other planets for resources. In this film, humans destroyed Keplar and left the locals to suffer the consequences.

Additionally, *Arctic Dogs* and *WWY* also delve into issues of climate injustices but stay only near the surface. The flooding in *Arctic Dogs* appears to make locals sad and worried because their businesses have closed. In *WWY* the audience is shown an old lady who had to leave her big house and move to an apartment due to the flooding of Tokyo. She is, however, a wealthy lady who is simply forced to move to a nice apartment, thus the films do not delve deeper into the consequences.

Do they fix the problem? – Violence, Sacrifice and Responsibility

Furthermore, I investigated how and if the characters solved or fixed the problem of climate change, or in the case of the two post-apocalyptic films, how they acted to restore the already climate-devastated world.

In this section, two recurring themes emerged – violence and sacrifice. In both *Arctic Dogs* and *Axel 2*, large battles take place to stop the villain from further destruction, and the hero must put his life at risk to save the day. *Deep* and *WWY* also showcase general violence with guns, though on a smaller scale. In all the films, the characters find themselves in situations of physical danger where some sort of sacrifice is required. However, this sacrifice is short lived.

In *Frozen II*, the two protagonists work together to save the forest. Elsa sacrifices her life to reveal the truth to Anna. Anna, in turn, risks her life to destroy the dam for the greater good, even though this decision will cause Arendelle to flood. Despite the sacrifices, none of the characters face permanent loss. Elsa returns, and the spirits of nature save Arendelle because of Anna's actions. The outcome, while showcasing that good deeds will be rewarded, weakens the lesson as no significant sacrifice or change was ultimately necessary.

In *WWY*, the sunshine girl is required to sacrifice herself to restore normal weather patterns. She willingly fulfills this duty, but Hodaka, the film's protagonist, believes she has done enough and brings her back from the spirit realm, resulting in prolonged rain and flooding in Tokyo. This film delves into issues of morality, questioning whether it is her responsibility to fix the weather, even though she is a young child – returning to issues of generational injustices. The narrative challenges audiences to question Hodaka's decision. While the film does not provide clear answers and remains morally ambiguous, it encourages contemplation on personal responsibility and on accepting the consequences of our actions in the face of climate challenges.

5.2.2 How are climate futures represented?

Change: Desirable or undesirable?

This section aims to look at how desirable or undesirable the futures presented in these films are. Although some films end with an undesirable future, it is important to note that all these films end on a hopeful note. As previously mentioned, Milkoreit (2017) mentions the importance of also looking at undesirable futures, because it allows us to see potential futures that we may have to confront as a society. This is the case with *WWY,* where the film ends on a clearly undesirable note, where it has been raining non-stop in Tokyo for three years and half the city is now underwater. The film makes us imagine a future where we must live with (and come to peace with) the consequences of our decisions. Though the world is undesirable, people adapt – children learn to play in the rain, people move homes and life carries on.

Deep and *Axel 2's* entire plot both take place in an undesirable climate future. In *Deep*, characters must live in a trash infested ocean where most sea creatures have perished. At the end of the film, however, the audience is given hope that the ocean is making a comeback. Similarly, *Axel 2* starts in a dangerous and undesirable desert wasteland with a leader who leads through fear, violence, and even sacrifices. According to Baker (2020), climate imaginaries often evoke imaginations of social chaos, where "anarchy narratives of crises seem to resonate more than those that advance altruism and collective action" (p.143). Nonetheless, despite this, this film ends with a very desirable future, where the autocracy falls, and nature and water return the planet into the beautiful paradise that it once was. Surprisingly, there is a change of governance/leadership in *Deep, Axel 2* and *Frozen II* at the end of the films*.*

Frozen II and Strange World's future is different than the utopia that they both started as, but they look at the change in a positive light and even in a desirable one. In the latter film, the world changes drastically after Pando dies, and it shows that such changes do not lead to societal collapse and that people are resilient. Regardless of the hardships, the world remains a beautiful utopia with strong community values. Despite this desirable future, the filmmakers felt the need to add a hint of an additional future right at the end, where we see the town gather happily to welcome their new source of energy – wind. This 'return to normal' after the change is also shown as desirable.

In *Arctic Dogs*, the world returns to normal, which is interpreted to be desirable. In fact, it returns so much to normality, that the characters seem to have forgotten about the threat of climate change and

the temperatures in the arctic have 'magically' returned to normal. In the end the protagonist has achieved everything he desired – a successful job, friends and a girlfriend.

Relationship with nature

When looking into climate imaginaries, it is important to adopt a human-environmental perspective, where nature serves an active role in what can be imagined (Milkoreit, 2017). Thus, this section looks at how the films depict the characters' relationship with nature.

In every film, except *Arctic Dogs*, there is some sort of appreciation of nature. Arctic Dogs really stands out because of its complete disconnect with nature, especially considering that all the characters are different animals. There is reference to the main protagonist being an arctic fox and having evolved to blend in, yet society looks at it as being old fashioned to, for example, wear white clothes to continue blending in and maintaining the evolutionary adaptation. Nature is never spoken about – neither as being beautiful nor in danger – it is just the place they live. They are worried about their homes flooding, but aside from that, there seems to be no attachment to the place and even the animation does not focus on scenery.

In *Axel 2*, the slow scenes which appreciate the beauty of nature stand out in the heavily action-packed film. One scene comes to mind, when the then unrevealed antagonist remembers how "magical"(Lee, 2017, 00:38:00) the ocean on Earth used to be and sits in silence with the protagonist trying to imagine the sound of the ocean. In *Frozen II* there are also a few mentions of the beauty of the forest and the animation also carries a lot of weight here, since it focuses on portraying nature in a beautiful manner.

Additionally, in *Frozen II, Strange World* and *WWY*, nature is shown to be alive and as a feeling and thinking entity. In *Frozen II*, the forest is made up of four elemental spirits – *earth, air, fire, and water*. The spirits are the ones who closed the forest down because they became angry at humans. The protagonists must restore harmony with nature. The characters discover that Elsa is the fifth spirit – who is "said to be a bridge between [humans] and the magic of nature"(Buck & Lee, 2019, 00:44:50). Though it attempts to emphasize the importance of living in harmony with nature, by separating the realms of humans and nature, the film still ends up taking an anthropocentric approach, where humanity is put on the same level of hierarchy as nature.

Strange World also deals with the theme of living in harmony with nature. It explores the generational differences of values with nature. The older generations – Ethan's father and grandfather – both see nature as something that can be conquered, controlled, used, and even killed for their purposes. They both immediately assume the creatures in this new world are monsters while Ethan sees them as

"fantastic creatures"(Hall & Nguyen, 2022, 00:31:02). The clearest instance of these differences is when they play a board game, and the grandfather and father are completely incapable of understanding the objective of the game – which is "to live harmoniously with your environment" and "build a working civilization utilizing the environment around you"(Hall & Nguyen, 2022, 00:53:14). Both characters are unable to understand a game without a 'bad guy' - referring directly to the idea that climate change has no bad guy. Instead, they want weapons and tools to destroy the 'monsters' of the game. Ethan symbolizes a different approach and relationship with nature – one of coexistence and kindness.

Moreover, *WWY* delves into the complex relationship between nature and human emotions, showing how the weather is such an important part of our daily experiences. In one scene, Hodaka reflects on how the weather affects us, saying "the human mind works in mysterious ways, sometimes, you just need to see the sunshine in the morning to feel energized […] it's amazing how a simple thing like the weather can affect our moods […and] just how much the human heart is connected to the sky"(Shinkai, 2020, 00:36:50). The film reflects on our connection with nature on a deeper emotional level and how climate change will be accompanied by emotional change, as well as physical change.

6 Discussion

In this paper I have answered two research questions. RQ1 was "How is climate change depicted in children's animated films? And how are climate futures represented in them?"

The first insight is about the genres that film makers can use to tell stories about climate change. Referring back to Svoboda's seven genres, all six movies fall in the category of children's animated films, yet they also have other genres within them. Both *Deep* and *Axel 2* can be considered dystopias, while *Arctic Dogs* is a clear example of a disaster movie, where life returns to normal, and *Strange World* is more of an apocalypse film, where there are major lifestyle changes at the end. *Frozen II* easily fits in the aliens and superheroes category, where magic is used to save the day. Finally, *WWY* is the only film that does not seem to fit any of the other six genres – it is a romantic coming of age film. This shows the possibility and emergence of new genres which filmmakers can use to tell stories about climate change.

The second insight is about the type of climate issues portrayed and the avoidance of explicitly dealing with climate change. The movies portrayed a range of climate-related challenges, aligning with Svoboda's (2016) findings, including flooded worlds, torrential rains/storms, melting tundra, and

desert worlds. Like in Giaccardi et al.'s (2022) study, "when extreme weather events are mentioned, they are rarely [only in *Arctic Dogs*] linked to climate change"(p.2), showing a clear avoidance of controversial topics by filmmakers (Molek-Kozakowska & Nicieja, 2020). *Deep* and *WWY* are so clearly about climate change, and yet, filmmakers used an ambiguous and cautious framing (Molek-Kozakowska & Nicieja, 2020)

Like in Svoboda's (2016) study, dystopias, apocalypse and disaster genres also made up the majority of the films in this study. However, although these genres tend to be "dark and declinist" in climate films (Dasilva, 2019), this was not the case for this group of films, because even though many showed undesirable futures, all of the films ended on a very hopeful note. As previously mentioned, children's imagination of the future is very much shaped by their emotions in relation to the issue (Spyrou et al., 2022). Hope and positive emotions impact children's pro-environmental behaviors (Ojala, 2012), and it is therefore relevant that all the films left audiences with a glimmer of hope. Adding to the optimistic mood of the films is their appreciation and beautiful depiction of nature, where nature is not a backdrop but takes center stage in the plot.

However, despite hopeful endings, fear and anxiety were used to move the plot along. In many of the films, the characters saved the world at the very last second, showing audiences the possibility of being too late to save the earth. Such messages create "a risk [of] introducing a sense of resignation instead of mobilization" in audiences (Molek-Kozakowska & Nicieja, 2020). Additionally, these urgent narratives show the difficulty of portraying the real time scale of climate change in stories, which run the risk of overexaggerating the effects and speed of climate change – which could potentially increase climate pessimism among children. Adding to these negative messages, all the films put responsibility on youth to fix the problem, sending a message to children that we will not succeed in fixing the problem, and that the burden will be up to them to do it. Milkoreit (2019) states that "fear might be necessary to increase concern, but it has to be accompanied by a sense of hope and agency" (p.78), which these stories do.

The final insight into this first question looks at the depiction of violence in these films. Benner et al. (2019) highlights that dominant climate imaginaries tend to emphasize large-scale violence triggered by climate change, while silencing the "slower, less visible forms of violence [...] ones often felt by people in the non-Western world" (p. 30). These slower forms of violence "are less visible and harder to narrate than major disasters or global ecological breakdown" (p.5). Yet, surprisingly, all the films examined in this study shed light on some elements of climate injustice, bringing attention to slower forms of violence that are inherently linked to climate change, including generational injustices, climate injustices, and even colonialism. Climate change is a force that increases human suffering, but

in an unequally distributed manner (Benner et al., 2019), something that all of the films try to point out in one way or another. However, it is important to note that like in many dominant climate imaginaries in pop-culture, "large-scale direct violence" (Benner et al., 2019, p. 13) also features heavily in these films.

Next, I delve into **RQ2,** "how are the narratives around climate change being constructed in children's animated films?".

The first insight is about how filmmakers have attempted to portray the complex temporal and spatial scale of climate change in these films (Meifert-Menhard, 2020). There is a clear intent by most of the filmmakers to show the globality of the problem, even when the story stays on a local level. Additionally, although all stories used a linear timeline, almost every film included time jumps and flashbacks to depict changes over time. Also, not using villains in most of the stories shows intention by filmmakers to move past the traditional good versus evil trope and show more complexity of problems. The filmmakers attempt to make the abstract notion of climate change more tangible (Milkoreit, 2017).

The second insight involves a critical examination of the creators behind these films. It is evident that beyond direct authorship, broader factors come into play in shaping these narratives. While my analysis highlighted a discernible gender bias among the writers/directors, it merely scratches the surface of deeper power dynamics (Milkoreit, 2017). Understanding these dynamics is crucial, as power can significantly influence the direction and constraints of imaginative storytelling (Benner et al., 2019). Future research should delve into financial and authoritative influences, exploring the individuals, studios, and companies supporting these films and unveiling any potential conflicts of interest that may impact the portrayal of climate-related imaginaries.

Additionally, analyzing the *real* and *imagined reader/viewer* offered valuable insights into my positionality as an adult researcher exploring children's films. For several of the films, I did not feel the emotions of the *imagined reader*. Hogan (2013) states that there is "some failure when the real reader does not experience the same emotion as the implied reader. The failure may be in the reader or in the text" (p.55), and in this case, my distance from the intended viewership is the most likely reason. Future research could include children to assess their emotional reactions and interpretations of the films and help bridge this gap.

Finally, we move on to **RQ3**, "What do children's animated films tell us about society's capacity to imagine alternative climate futures?". This question explores the implications of the imaginaries portrayed in the films.

To delve into the climate imaginaries depicted in these films, I analyzed how the futures changed and human-nature relationships (Levy & Spicer, 2013; Milkoreit, 2017). I attempted to chart the films into Levy and Spicer's (2013) graph previously shown in *Figure 2*. However, due to the complexity and nuanced approach to nature in these stories, it proved challenging. While Levy and Spicer simplify nature as either fragile or resilient, most films present a more nuanced understanding of nature, where it can be both. They depict nature as fragile, easily harmed or destroyed by humanity, yet remarkably resilient in making a comeback. The narratives are dynamic, making it difficult to plot them on a simplified graph.

Nonetheless, an attempt to position the films on the graph, comparing their imaginaries to the four dominant ones, can be seen in *Figure 5*.
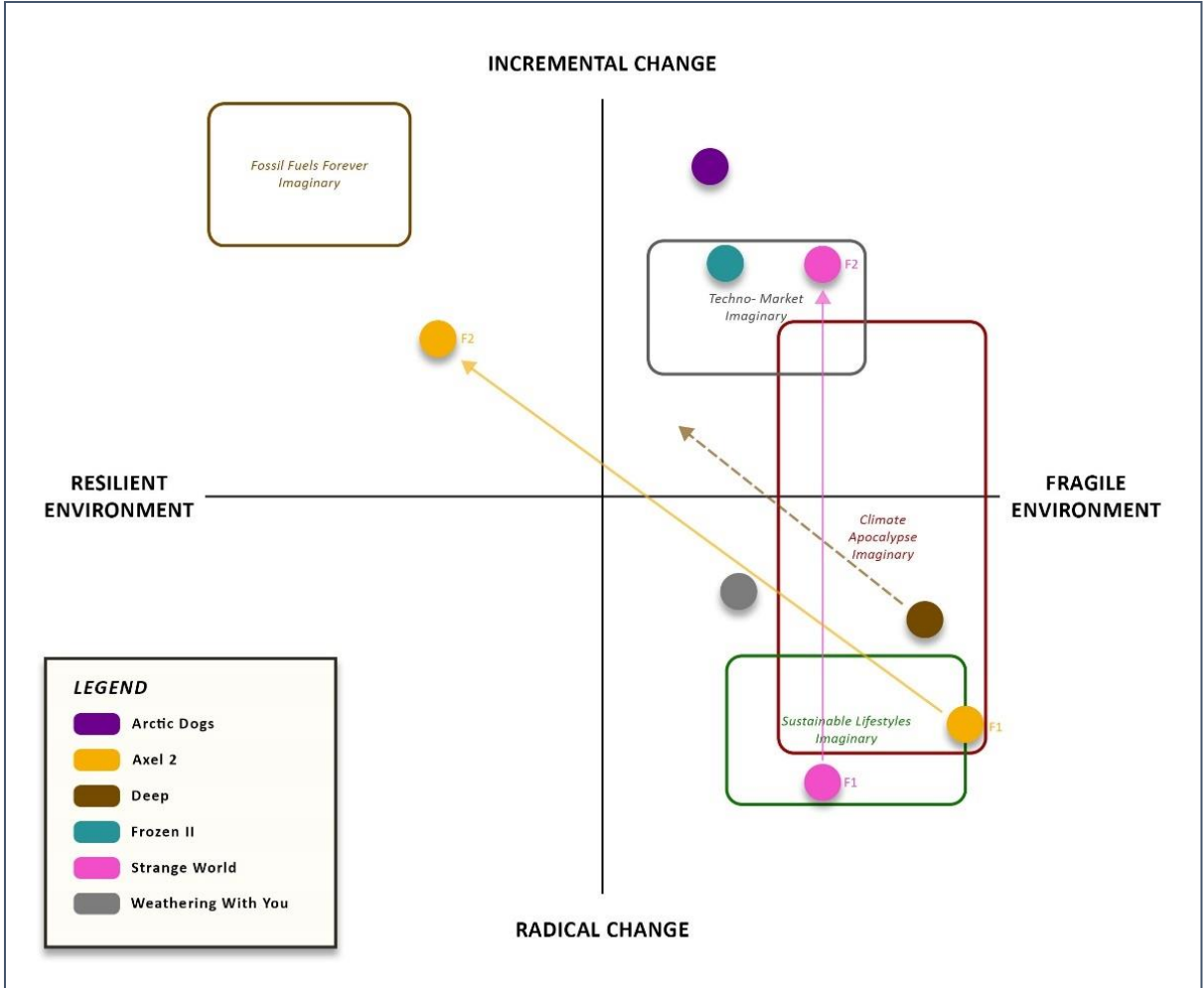
Figure 5. The six films of the study plotted in Levy & Spicer's (2013) graph of dominant imaginaries. The dotted arrow shows a suggestion by the film towards a new future, while the other arrows show the movement from one future (the first future – F1) to another future (the second future - F2).

The graph yielded interesting observations— *Deep* and *Axel 2*, start in the climate apocalypse imaginary and later transition out of it. *Strange World* features two futures (F1 and F2): the first aligns

with the sustainable lifestyle imaginary, where characters adapt to a simpler lifestyle, but it shifts to the techno-market imaginary, where new clean energy promises to restore life to its previous state. *Frozen II* might be argued to fit within the techno-market imaginary, where magic serves as a 'technological' fix and only relatively small changes are required, whereas *Arctic Dogs* requires no change. The most interesting and distinctive imaginary is presented in *WWY*, envisioning nature as somewhat fragile and necessitating some significant lifestyle changes. However, these changes focus on the adaptation and resilience of people. It does not fit into either the sustainable or apocalyptic imaginary yet exists in the same quadrant. The future has changed, and people have adapted to it, depicting a less-catastrophic/non-apocalyptic view of climate change. Apart from *WWY*, the imaginaries shown in the films come quite close to the dominant imaginaries, and do not propose new ideas about the future.

Imaginaries play an important role in climate knowledge and action (Benner et al., 2019). They are essential for motivating transformative change – and these imaginaries show important depictions of mitigation and adaptation – giving viewers a sense of hope and agency (Milkoreit, 2017). It is important to look at both desirable and undesirable imaginaries because it allows us to peek into alternative futures we might want or want to avoid.

This study paints a somewhat different picture than other studies on climate films and media have suggested – less apocalyptic, more positive and hopeful, and showing solutions. You could even argue that *Strange World* and *Frozen II* are part of Townsend's (n.d.) missing "how we fixed it" typologies, where both offer successful examples of mitigation. *Deep, Axel 2,* and *WWY* could even take on a new typology – the 'how we adapted' typology.

6.1 Limitations

This section will delve into some of the limitations of my study. Because of the scope of the work and due to my limited search criteria, my sample size is relatively small. However, it is a relatively diverse sample, in terms of countries of production, studios and age range. Due to the sample size and the nature of qualitative studies, the research does not allow for generalizations to be made, but it can bring about interesting insights to delve deeper into in future research.

My selection criteria has a number of limitations. First, my search was done in English, which could limit my findings of non-English films. Second, the search terms were few and limited, but due to time constraints, I had to choose a manageable amount. My choice to review all links in the first two pages of *Google* required was a judgement call I had to make to not make the search endless. Finally, since

my search terms were mostly linked to climate change, someone before me had to have made the link between the films and climate change, thus more metaphorical or implicit movies may have been missed.

Finally, as stated by Lieblich et al. (1998), in qualitative studies, researchers strive for "non-judgmental readings" and aim to avoid "extensive theoretical interpretations", yet "every reader is inevitably bringing [their] culture, language experience and expectations" into their interactions with the texts. As the researcher, I made a conscious effort to be a "naïve listener" (p.76) but acknowledging that the interpretation is not an absolute truth but one possibility based on the inference processes (Lieblich et al., 1998). Although qualitative studies, by their nature, cannot encompass all perspectives or capture an absolute truth, they provide deep, rich data which can provide valuable insights and understandings (Bryman, 2016).

7 Conclusion

In today's media landscape, climate change representation is pervasive and prominently visible. Children receive a substantial portion of their information about climate change through films and other media, which can significantly impact how they perceive this critical issue and their emotions around it. (Meifert-Menhard, 2020; Morote & Hernández, 2022)

Despite prevailing research depicting media narratives on climate change as predominantly bleak and apocalyptic (Dasilva, 2019; Levy & Spicer, 2013), this analysis focused on children's films revealed an unexpected and hopeful narrative of the future. The films also delved into complex themes of climate justice, scale, and human-nature relationships. Moreover, many offered solutions and emphasized our capacity for adaptation. However, the films maintained a fearful framing through violence and urgency, which could potentially induce inaction and resignation (Milkoreit, 2017).

Understanding these nuanced narratives is vital as they shed light on how children perceive climate change through media, potentially influencing their actions toward sustainability.

Looking forward, broadening the research horizon to encompass other media formats that children engage with is essential. Exploring climate change portrayals in live-action films, TV, videogames, social-media, etc. can provide a further understanding of children's relationship with climate change and futures.

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9 Appendix

<u>Appendix 1: Movie Analysis Document</u>

Movie name:

    I.   **<u>Context:</u>**

Year:

PG Rating:

Genres:

Rating: IMBD xx/10; xx% rotten tomatoes

Country/ies of production:

Studios:

Original Language (and watched language):

Box office: $

Directors:

Writers:

Other important context:

    II.   **<u>Content Analysis</u>**

        1. How is climate change depicted?

For example: direct/metaphorical, urgency, scale, justice/morality, values, culture, apocalypse, dystopia, intergenerational justice/values, relationship with nature, problem/solution (technical, political, social, existential), role of science and technology, etc.

        2.** **Are there connections between CC and the broader environmental crisis drawn? And how?

For example: deforestation, biodiversity, extinction, waste and pollution, etc.

        3. Who cares about CC? And who doesn't, and why?

For example: character motivations, protagonists/antagonists, heroes/villains, is there someone to blame?

4. How is climate action depicted?

For example: individual or group action, violence/peace, sacrifice, war, economic, technological changes, etc.

5. How is the future imagined in these movies? And how normative *(desirable, undesirable, and to whom?*) are they?

For example: desirable/undesirable futures, role of science and technology, lifestyle change or return to normal? Incremental vs radical change? Social changes - political, economic and technological change, adaptation and/or mitigation, dystopia/utopia, who benefits and who doesn't?

6. What is my interpretation of "the lesson to be taught"?

III.   RQ2

1. Narrative Discourse Analysis - Who?

Real author [[narrator[narratee]implied reader] Real reader

Real author:

Narrator:

Narratee:

Implied Reader:

Real reader:

How do the movies make me feel? And how are you meant to feel?

2. Narrative Structure Analysis - How?

Storyline structure, time, and scale:

For ex: (pacing, flashbacks, flashforwards, etc…); narrative structure as a whole; scale

The significance of setting to the story