



Intergenerational differences on the cultural imagery of AI in the storytelling and iconicity of animated films for children and young people

Diferencias intergeneracionales en el imaginario cultural de la IA asociadas al relato y la iconicidad del cine de animación infantil y juvenil

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ABSTRACT

Introduction: The Trust in Artificial Intelligence: a global study (Gillespie et al., 2023) reflects a bias in the perception of AI among Baby Boomers and Generation X with respect to Millennials and Generation Z. What is the reason for this intergenerational gap? Socio-cultural and contextual elements play a role, as well as the transfer of values that shape the collective Western imaginary to the new generations through the audiovisual media. This cinematographic imagery is characterized, in part, by scientific determinism and capital arguments related to AI such as the rebellion of machines, otherness and the construction of apocalyptic dystopias. **Methodology:** Combining the inductive hermeneutic method with film discourse analysis, common patterns are identified in the different socio-cultural narratives. The corpus has been concretized in the 20 highest rated films (IMDB, July 2023) with presence of AI and its application to robotics in animated cinema aimed at children's audiences. **Results:** The results position animated films for children and young people far from posthumanism and the themes of human vs. machine or the myth of Prometheus. Likewise, the figure of the intelligent robot in children's films assumes the role of friend, mentor or hero. **Discussion and Conclusions:** Therefore, Generation Z imageries are not characterized by an AI that poses a danger, nor the end of the human species or its replacement, but symbolize hope, heroism or companionship. These are elements that, according to the discussion of the results, have contributed to widening the gap between generations with respect to the cultural imaginary about AI applied to robotics.

Keywords: Artificial intelligence; animated films; cinematographic imagery; scientific determinism; robots; sociocultural narratives.

RESUMEN

Introducción: El *Trust in Artificial Intelligence: a global study* (Gillespie et al., 2023) refleja un sesgo en la percepción de la IA entre los *Baby Boomers* y la Generación X respecto de *Millennials* y Generación Z. ¿A qué se debe esta brecha intergeneracional? Influyen elementos socioculturales y contextuales, así como la transferencia de valores que configuran el imaginario colectivo occidental a las nuevas generaciones mediante los medios audiovisuales. Este imaginario cinematográfico viene imperado, en parte, por el determinismo científico y los argumentos capitales relacionados con la IA como la rebelión de las máquinas, la otredad y la construcción de distopías apocalípticas. **Metodología:** Combinando el método hermenéutico inductivo con el análisis de discurso cinematográfico, se identifican patrones comunes en las diferentes narraciones socioculturales. El *corpus* se ha concretado en las 20 películas más valoradas (IMDB, julio 2023) con presencia de IA y su aplicación a la robótica en el cine de animación dirigido al público infantil. **Resultados:** Los resultados posicionan al cine de animación infantojuvenil lejos del posthumanismo y de los mitemas del ser humano contra la máquina o el mito de Prometeo. Asimismo, la figura del robot inteligente en el cine infantil asume el rol de amigo, mentor o héroe. **Discusión y conclusiones:** Por tanto, los imaginarios de la Generación Z no se caracterizan por una IA que suponga un peligro, ni el fin de la especie humana o su sustitución, sino simbolizan esperanza, heroísmo o compañerismo. Elementos que, según la discusión de los resultados, han contribuido considerablemente a acrecentar la brecha entre generaciones respecto del imaginario cultural sobre la IA aplicada a la robótica.

Palabras clave: Inteligencia artificial; cine de animación; imaginario cinematográfico; brecha intergeneracional; robots; narraciones socioculturales.

1. INTRODUCTION

According to the thesis put forward by Abraham Moles (1991), iconicity, understood as a holistic and total scale of levels, was the relationship of resemblance or the means by which human beings developed their communicative capacity. The actual reality was equated with the represented reality. For this reason, it

understand how cultural icons, mythemes and stereotypes shape the iconicity and imaginary from which the sociocultural narratives that build the discourse of audiovisual content arise is a topic widely studied for its interest and relevance in society (Acosta-Damas, 2016; Fernández, 2021; Gastaca, & Iturregui, 2022; among others). It is here where it becomes even more important and from which numerous lines of debate arise when, specifically, the subject of study focuses on the narratives that make up the audiovisual content aimed at children, a social group where the collective imagery begins to be forged (Kushnir, 2022).

In this regard, one of the topics that currently generates most debate and discrepancies in sociocultural narratives is the representation of artificial intelligence (hereinafter AI), the way young people perceive AI and how it will affect their future. According to "Trust in Artificial Intelligence: a global study" (Gillespie et al., 2023), there is considerable bias in the aforementioned perception of AI by Baby Boomers and Generation X relative to Millennials and Generation Z. What is the reason for this intergenerational difference? There are countless sociocultural and contextual elements and external agents that can influence the social imagery; therefore, it is necessary to ask ourselves what is the impasse from the aforementioned iconicity to sociocultural narratives, and what elements and variables are part of the construction of the imagery of a generation with respect to a particular topic?

1.1. From iconicity to sociocultural narratives through storytelling

If it is characteristic of human beings to think and communicate, the development of cognitive capacity, first through intuitive thinking and later through logical thinking, both of the Indo-European and Afro-Asiatic matrix as well as the Sino-Tibetan and Eskimo-Aleut, even the Austronesian, was preceded by an iconic stage. Cave art, whether based on petroglyphs or paintings, is a clear example of this. Hence the importance that, once the ability to communicate, verbally or non-verbally, acquired the metaphor, the allegory or the parable. These three linguistic and literary resources are nothing more than different analogies by which an experience and an idea are represented through the formulation of symbols constructed by means of signs. Thus, certain terms tended to be perpetuated in the form of myths (Keane, 2018), which upon reaching the third and final stage, the written one, went on to form the oral tales and written stories on which the culture of the human species is based.

These stages are consistent with the main research on the analysis of the development of human beings themselves. Thus, the Swiss psychologist Jean Piaget (1896-1980), within the stages of cognitive development, places the symbolic stage in the preoperational stage, from which one passes to the operational stage, in which the human beings already think and express themselves. For his part, the American psychologist Lawrence Kohlberg (1927-1987) places it in the conventional or communitarian period, when people share codes, since he focuses on the sociological development stage. In any case, myths or archetypes are culturally passed on, from generation to generation, through those narratives shared in community. Moreover, the community itself is generated around that collective imagery.

As mentioned above, one of the fundamental instruments for passing on the values on which moral consensus is built in a society are stories. The Genesis (16th century B.C.), the Rigveda (13th century B.C.) or the Dàodé jīng (6th century B.C.), are the earliest of the world's major traditions. They emerged at the dawn of the Ancient Ages, already elaborating their first myths and the values they propose. In addition, these myths are the ones who testify the values through their actions. For this reason, they have become one of the main means of intergenerational knowledge. A great advantage of myth is its interpretation, since the values it possesses can be reinterpreted in another historical period or in another cultural circumstance, as shown by Gubern in *The Ghosts in the Mirror* (1993), Durand in *De la mitocrítica al mitoanálisis* (1993) or Balló and Pérez in *La semilla inmortal* (1995). As an example, Rambo can be an adaptation of Achilles, just as Moby-Dick can be an adaptation of The Odyssey or Frankenstein's creature of the myth of Prometheus, because the interest in adaptation is the narrative efficacy of myths and narratives, as Vladimir Propp showed in *Morphology of the*

Folktale (1928). This is due, in great extent, to their moralizing purpose, their symbolic character, their cognitive structure and their potential for interpretation.

In this way, narratives remained practically unchanged until modernity, when the printing press multiplied their accessibility to the public at large. In the 20th century, with the appearance of cinema, radio, television and later the Internet, sociocultural narratives became more realistic and reached the general public. Hence, audiovisual and digital media are the preferred means for the transmission of myths that shape not only the collective imagination but also its axiological transfer. Today, filmmaking and video games have largely replaced the tales of yesteryear due to their dynamism and constant evolution. It should be remembered that, because of their ability to adapt to change, the first recipients and consumers have been children and young people.

1.2. Mythemes, scientific discourse and ethical approaches in the film imagery of robotics

If storytelling and myth are a constituent part of sociocultural narratives, it is worth asking what the film imagery is like in relation to AI applied to robotics. Intelligent robot movies are influenced by various myths and classical narratives, among them, the most common is the myth of Prometheus (Nieto, 2022). Since then, the creation of artificial life endowed with intelligence and consciousness has been present in very influential works in culture and iconography, such as *The Adventures of Pinocchio* (1882) by Carlo Collodi or *Frankenstein* or *The Modern Prometheus* (1818) by Mary Shelley. However, the first novel to introduce the term robot is Rossum's *Universal Robots* (1921) by novelist Karel Čapek R.U.R. (Vidal-Mestre et al., 2023). From this point on, Thea von Harbou's novel *Metropolis* (1925) and the work of Isaac Asimov and his well-known laws of robotics greatly influenced film narratives of intelligent robot cinema such as *Metropolis* (Lang, 1927), among others. Technological advances were added to these influences, such as the invention of the first computer in 1946, which, for the first time, made it possible to think about the possibility of human beings being able to develop systems that could execute their decisions. Based on this thought, in 1950, the mathematician Alan Turing (1912-1954) raised the possibility of such computer systems being able to reason and designed the well-known Turing Test which, together with the novel *Do Androids Dream of Electric Sheep* (1968) by Philip K. Dick, inspired the film *Blade Runner* (Scott, 1982).

Since then, and with a few exceptions such as the iconic and friendly androids C3PO and R2D2 of the *Star Wars* saga, science fiction films featuring computers or intelligent robots have been characterized by representing AI as a threat to humanity (*2001: A Space Odyssey*, Kubrick, 1968) that implied the end of the human species (*Terminator*, Cameron, 1984; *The Matrix*, Wachowski, 1999) and the consequent replacement of the human being (*Blade Runner*, Scott, 1982; *A.I.: Artificial Intelligence*, Spielberg, 2001). Mythemes such as the rebellion of the machines (Ojeda, 2019; Masís, & Castro, 2021), apocalyptic dystopias (Rodríguez, 2020) derived from scientific determinism (Sannazzaro, 2015; Masís, & Castro, 2021) or posthumanism are present in numerous films such as *I, Robot* (Proyas, 2004), *Eva* (Maillo, 2011), *Automata* (Ibáñez, 2014), *Chappie* (Blomkamp, 2015), *Alita: Battle Angel* (Rodríguez, 2019) and in the long-running sagas of the *Matrix* and *Terminator* universes. In addition, as Viidalepp (2020) ponders, the representation of intelligent robots in science fiction films blurs the boundary between human and machine, and sometimes robots mimic human behavior.

In recent decades, animated films aimed at children's audiences have also incorporated new forms of AI embodiments within society. From the award-winning *Wall-E* (Pixar, 2008), *Big Hero 6* (Disney, 2014) and *Ralph Breaks the Internet!* (Moore, & Johnston, 2018), featuring not ordinary robots but AI-driven characters from a video game. The reproduction of intelligent robots has been a constant in children's films and series and, in this regard, has outlined patterns of representation and conceptualization of AI that, a priori, seem different from the collective and social imagery shaped by science fiction aimed at adult audiences. This

sociocultural and pedagogical construct has been invaded by robots, whether in a heroic, mentor or companion role, sometimes substituting the human being in sociocultural narratives.

AI applied to robotics has become one of the recurring themes in the vast, complex and multifaceted panorama of films and animated series aimed at children and young audiences. However, in the face of the unavoidable mirror-comparison of the representation of AI and robotics in science fiction films aimed at an adult audience, it is worth asking whether these themes or mythemes are also recurrent in films aimed at children and young audiences. What is their scientific discourse like? What kind of aesthetic, symbolic and narrative representation do intelligent robots have? What is the relationship between humans and robots like? How do they approach issues such as posthumanism, the bioethics of robotics and the rights and obligations of robots?

2. OBJECTIVES

This article has the following objectives:

- To create a framework of reference that allows extracting the narrative and cinematographic discourse variables to analyze the research corpus.
- To analyze according to these variables the film discourse and to establish common and differential characteristics in children's animated films with the presence of AI applied to robotics with respect to science fiction films.
- To discuss the results in relation to the main theories of this field of study according to the specialized literature that allows to answer the reasons why there is an intergenerational gap regarding the perception of AI. Therefore, the cinematographic imagery can be considered as an element that causes it.

3. METHODOLOGY

In order to address these objectives, the main variables, mythemes (traditional mythological tropes), archetypes and insights that have characterized the science fiction films concerning AI applied to robotics according to the specialized literature have been extrapolated. This methodology, hermeneutic in nature and adapted from Vidal-Mestre et al. (2023), has taken into account classic principles and axioms of science fiction literature, such as the laws of robotics and other tropes from the works of Isaac Asimov or the novels of Philip K. Dick, especially *Do Androids Dream of Electric Sheep?* (1968), which have inspired films such as *Blade Runner* (Scott, 1984) or *I, Robot* (Proyas, 2004), among others. Likewise, academic research on the field has been taken into account, such as those derived from the principles of robotics by Pérez (2004), the emerging AI subjectivities by Barrios et al. (2020), insights on scientific determinism (Sannazzaro, 2015) or posthumanism (Gastaca, & Iturregui, 2022). Similarly, the study of the reproduction of mythemes of this film subgenre such as the rebellion of the machines (Ojeda, 2019; Masís, & Castro, 2021), the apocalyptic dystopia (Ferrer, 2017; Masís, & Castro, 2021) or the myth of Prometheus (Nieto, 2022) is proposed.

The corpus has been specified in the 20 most valued films in July 2023 according to IMDB (<https://www.imdb.com/>) with presence of artificial intelligence in films for children and young people and in which the scientific discourse is limited and, specifically, that of AI applied to robotics in animated films aimed at a social sector between 6 and 18 years of age. The following table lists all the elements considered in the study and the consulted references:

Table 1. Variables for the analysis of characters having AI in films for children and young people.

Number of variables with respect to narrative elements and mythemes extracted from literature	References
(v1) Compliance with the laws of robotics.	Asimov, 1950.
(v2) The main character is a human being, while the robot is an antagonist or secondary character.	Asimov, 1950.
(v3) Humanity of androids is questioned (Turing Test).	Turing, 1950 in García-Manrique, 2016.
(v4) Sociological development of the robot.	Kohlberg, 1982.
(v5) Reproduction of universal themes (the ghosts in the mirror and <i>semilla inmortal</i>) and classical monomyths and mythemes.	Gubern, 1993; Balló, & Pérez, 1995; Campbell, 2020; Durand, 2005.
(v6) Every effort to bring about an artificial perfect being is aimed at tragedy.	Pérez, 2004.
(v7) The rebellion of the machines takes place.	Pérez, 2004; Ojeda, 2019; Masís, & Castro, 2021.
(v8) AI is autonomous and independent, but its creator is responsible for its actions.	Ojeda, 2019.
(v9) The plot is set in an apocalyptic and dystopian future.	Ferrer, 2017; Rodríguez, 2020; Masís, & Castro, 2021.
(v10) Posthumanism.	Gastaca, & Iturregui, 2022; Fernández Menicucci, 2021; Hidalgo, 2020.
(v11) Scientific determinism.	Sannazzaro, 2015; Masís, & Castro, 2021.
(v12) AI becomes conscious.	Retamal, 2022.
(v13) Dystopia understood as dirty realism.	Retamal, 2022.
(v14) It fulfills the myth of Prometheus and Frankenstein.	Nieto, 2022.
(v15) Debate on the human-non-human dichotomy is raised.	Gastaca, & Iturregui, 2022.

Source: Adapted from Vidal-Mestre et al., 2023.

As for the sample, it has been limited to animated films aimed at children targeting the presence of AI applied to robotics. It should be added that some of the films do not directly feature a robot or android. For example, *Wreck-it Ralph!* (Moore, 2012) shows characters from a video game that are part of the AI of an arcade machine. Therefore, it has also been decided to include those where the robot or android was considered to be indirectly related to the inanimate beings with AI that are either mechanized or part of an engineering.

Specifically, the sample has been limited to the twenty films with the highest ratings on the professional platform IMDB. This database has been considered as valid thanks to the high rate of user participation, the rigorousness of the data and because of its international relevance, as pointed out by Canet et al. (2016). Likewise, other research (Boulos et al., 2005; Dodds, 2006; Ahmed et al., 2007; Debnath et al., 2008;

Wasserman, 2015; Sanz-Aznar, & Aguilar, 2020) contributed considerably to the contrasting and consequent verification of IMDB as a reliable and relevant data source. Here is the sample of films:

Table 2. *Top 20 highest rated films according to IMDB (July, 2023) with the presence of artificial intelligence for children and young people as the target audience.*

Film, directed by, year	Characters with AI	Rating
<i>Wall-E</i> (Stanton, 2008)	Wall-E, Eva.	8,4
<i>Inside Out</i> (Docter, 2015)	Joy, Anger, Fear, Disgust, Sadness	8,1
<i>The Iron Giant</i> (Bird, 1999)	The Iron Giant	8,1
<i>The Incredibles</i> (Bird, 2004)	Omnidroid 10.	8,0
<i>Big Hero 6</i> (Hall, & Williams, 2014).	Baymax.	7,8
<i>Wreck-It Ralph</i> (Moore, 2012)	Ralph	7,7
<i>The Mitchells vs. the Machines</i> (Rianda, 2021)	Deboraboth 5000.	7,6
<i>Megamind</i> (McGrath, 2010)	Minion.	7,3
<i>Phineas and Ferb the Movie: Candace Against the Universe</i> (Bowen, 2020)	Norm	7,1
<i>Ron's Gone Wrong</i> (Smith, & Vine, 2021)	B-bot.	7,0
<i>Ralph Breaks the Internet!</i> (Moore, & Johnston, 2018)	Ralph	7,0
<i>9</i> (Acker, 2009)	9 and all other characters.	7,0
<i>Meet the Robinsons</i> (Anderson, 2007)	Doris.	6,8
<i>Next Gen</i> (Ksander, & Adams, 2018)	Project 77, Q-Bots.	6,6
<i>Robots</i> (Wedge, 2005)	Rodney Copperbottom, Crank, Piper and all other characters.	6,4
<i>Astro Boy</i> (Bowers, 2009)	Astro Boy, Robotsky, Uran, Zog.	6,2
<i>Lightyear</i> (MacLane, 2022)	Sox.	6,1
<i>Jimmy Neutron: Boy Genius</i> (Davis, 2001)	Jimmy Neutron.	6,0
<i>Planet 51</i> (Blanco, 2009)	Rover Robot Model.	6,0
<i>Ratchet & Clank</i> : (Munroe, & Cleland, 2016)	Clank, Ratchet's sidekick and squire.	5,5

Source: Elaborated by the authors.

4. RESULTS

By analyzing male and female roles in animated film, it was possible to extract the attributes that allow us to infer certain shared singularities that determine the scientific discourse of AI in animation. Common attributes and narratives are recognized and they show the recurrence in the use of patterns of representation of the appearance of AI. Although there are some exceptions that do not distort the conclusions, the results suggest the predominant existence of uniqueness in the treatment of AI in animation narratives aimed at children and young audiences. The image of AI is integrated into the existing narrative time, playing the role of companion and mentor, psychological and emotional support, with a mostly didactic, moralizing and humorous tone.

Animation offers dreamlike worlds and the representation of reality with fantastic overtones. Toys come to life as automated subjects that reproduce the roles of humans or animals as the main characters of challenges and moral conflicts that transcend the rules of the jungle or the enchanted forest. The evolution of animated narratives addresses the main dilemmas of the human being, such as the meaning of life, the development of the person or the development of emotions, but they also reach a higher degree of sophistication, even incorporating the relationship between the human being and scientific and technological development. In this case, the representation of AI has been recurrent, with specific characteristics typical of the genre, bringing children and young people closer to a kind and even friendly conception of the technical evolution of today's societies. The roles established between robots and people are distanced from the traditional treatment of the adult science fiction genre, which offers a more apocalyptic and dystopian look.

Unlike science fiction, animation shows AI as an integrated part of home lives of children being the main characters, empowering their abilities. For example, *Jimmy Neutron: The Boy Genius* and *Astro Boy*. Animation also brings to life faithful companions. For example, *Meet the Robinsons*, *Ron's Gone Wrong*, *Ratchet and Clank* and *Lightyear*. It can also make non-human characters become heroes as in *The Iron Giant*, *Big Hero 6* and *Next Gen*. As for the adventures or objectives of these characters, there are many examples of those who come to the rescue of the planet like *Wall-E*, *Cloudy with a Chance of Meatballs* and *Megamind*. In addition, for the most part, the characters represent human behaviors and emotions. For example, *Robots*, *Inside Out*, *Wreck-it Ralph!*, *Ralph Breaks the Internet!* or *Big Hero 6*.

Films depicting AI in films for children and young people stand as examples of constructivist learning and teaching of the main character of these films, who is generally a human child. The AI plays the role of tutor or companion, providing the apprentice with the necessary resources to solve conflicts and modify the ideas throughout the training process. The procedure is active and dynamic and allows the beginner to be defined as a cognitive subject through action-oriented teaching. This training enables them to acquire competencies to face everyday situations throughout their development stages.

The fifteen predominant variables in each of the analyzed corpus films are summarized below. In order to provide greater clarity, they have been divided into those that correspond to themes and elements typical of literature and universal narrative structures, as opposed to current approaches and insights on AI:

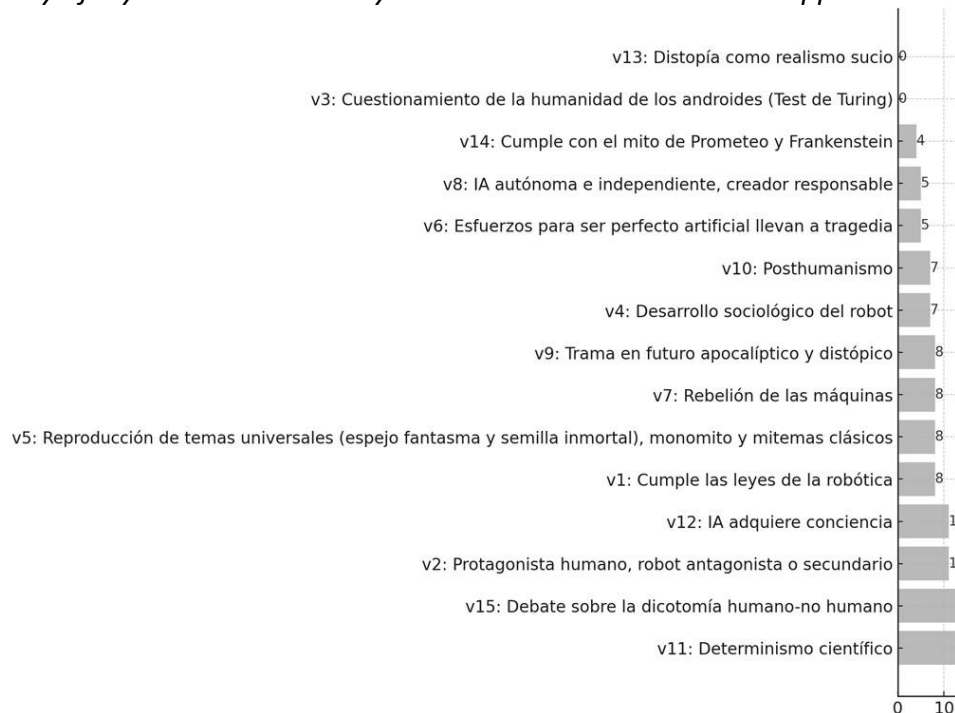
Table 3. Characters analyzed and variables, mythemes, archetypes and prevailing approaches that are fulfilled.

Characters with AI	Mythemes and literary elements in the narrative	Approaches to AI in the subtext
Wall-E and Eve (<i>Wall-E</i> , Stanton, 2008)	(v1)compliance with the laws of robotics; (v5) universal themes and the hero's journey; (v9) apocalyptic and dystopian future; (v12) the AI becomes conscious.	(v10) posthumanism; (v11) scientific determinism; (v15) human-nonhuman dichotomy.
Fear, Anger, Disgust, Joy, Sadness (<i>Inside Out</i> , Docter, 2015).	(v2) human being as the main character; (v4) sociological development; (v8) AI depends on its creator; (v12) AI becomes conscious.	(v15) human-non-human dichotomy.
The Iron Giant (<i>The Iron Giant</i> , Bird, 1999)	(v1) compliance with the laws of robotics; (v2) human being protagonist; (v4) sociological development; (v5) universal themes and hero's journey; (v12) AI becomes conscious.	(v15) human-non-human dichotomy.
Omnidroid 10 (<i>The Incredibles</i> , Bird, 2004)	(v2) human being as the main character, (v5) universal themes and hero's journey; (v6) tragedy oriented; (v7) machine rebellion; (v8) AI depends on its creator; (v9) apocalyptic and dystopian future; (v14) Prometheus myth	(v11) scientific determinism.
Baymax (<i>Big Hero 6</i> , Hall, & Williams, 2014).	(v1) compliance with the laws of robotics; (v2) human being as the main character; (v4) sociological development; (v5) universal themes and hero's journey; (v12) AI becomes conscious.	(v10) posthumanism (v15) human-nonhuman dichotomy.
Ralph (<i>Wreck-It Ralph!</i> , Moore,2012)	(v5) universal themes and hero's journey; (v7) machine rebellion; (v12) AI becomes conscious.	(v15) human-non-human dichotomy.
Deboraboth 5000 (<i>The Mitchells vs. the Machines</i> , Rianda, 2021)	(v2) human being as the main character; (v6) tragedy oriented; (v7) machine rebellion	(v11) scientific determinism; (v15) human-nonhuman dichotomy.
Minion (<i>Megamind</i> , McGrath, 2010)	(v1) compliance with the laws of robotics; (v14) myth of Prometheus.	(v11) scientific determinism.
Norm (<i>Phineas and Ferb the Movie: Candace Against the Universe</i> , Bowen, 2020)	(v1) compliance with the laws of robotics; (v2) human being protagonist; (v4) sociological development.	(v11) scientific determinism.
B-bot (<i>Ron's Gone Wrong</i> , Smith, & Vine, 2021)	(v1) compliance with the laws of robotics; (v2) human being protagonist; (v4) sociological development; (v12) AI becomes conscious.	(v15) human-non-human dichotomy.
Ralph (<i>Ralph Breaks the Internet!</i>) Moore, & Johnston, 2018)	(v5) universal themes and hero's journey; (v7) machine rebellion; (v12) AI becomes conscious.	(v15) human-non-human dichotomy.
9 and all other characters (<i>9</i> , Acker, 2009)	(v6) tragedy oriented;(v7) machine rebellion; (v9) apocalyptic and dystopian future; (v12) AI becomes conscious.	(v10) posthumanism.
Doris (<i>Meet the Robinsons</i> , Anderson, 2007)	(v2) human being as the main character; (v5) universal themes and hero's journey; (v9) apocalyptic and dystopian future;	(v10) posthumanism; (v11) scientific determinism.
Project 77, Q-Bots (<i>Next Gen</i> , Ksander, & Adams, 2018)	(v2) human being as the main character; (v6) tragedy oriented;(v7) machine rebellion; (v9) apocalyptic and dystopian future; (v14) Prometheus myth.	(v11) scientific determinism; (v15) human-non-human dichotomy
Rodney Copperbottom, Crank, Piper and all other robots. (<i>Robots</i> , Wedge, 2005)	(v1) compliance with the laws of robotics; (v9) apocalyptic and dystopian future.	(v10) posthumanism; (v11) scientific determinism; (v15) human-nonhuman dichotomy.
Astro Boy, Robotzky, Uran, Zog	(v4) sociological development; (v5) universal themes and hero's	(v11) scientific determinism; (v15)

(<i>Astro Boy</i> , Bowers, 2009)	journey; (v9) apocalyptic and dystopian future; (v12) AI becomes conscious; (v14) Prometheus myth.	human-non-human dichotomy.
Sox and robots (<i>Lightyear</i> , MacLane, 2022)	(v6) tragedy oriented;(v7) machine rebellion; (v8) AI depends on its creator; (v9) apocalyptic and dystopian future; (v12) AI becomes conscious.	(v11) scientific determinism; (v15) human-nonhuman dichotomy.
Jimmy Neutron (<i>Jimmy Neutron: Boy Genius</i> , Davis, 2001)	(v1) compliance with the laws of robotics; (v2) human being as the main character; (v4) sociological development; (v5) universal themes and hero's journey.	(v10) posthumanism; (v11) scientific determinism.
Rover Robot Model (<i>Planet 51</i> , Blanco, 2009)	(v1) compliance with the laws of robotics; (v2) human being as the main character; (v8) AI depends on its creator; (v9) apocalyptic and dystopian future.	(v10) posthumanism (v15) human-nonhuman dichotomy.
Clank (<i>Ratchet & Clank</i> , Munroe, & Cleland, 2016)	(v1) compliance with the laws of robotics; (v5) universal themes and the hero's journey; (v12) the AI becomes conscious.	(v11) scientific determinism.

Source: Elaborated by the authors.

Figure 1. Frequency of mythemes and literary elements in the narrative and approaches to AI in the subtext.



Source: Elaborated by the authors.

5. DISCUSSION AND CONCLUSIONS

Although the setting or context of a dystopian society or apocalyptic future is not an essential part of the narrative or the characterization of most of the characters analyzed, it is surprising that in 9/20 of cases there are typical elements of this sort of dystopias. Though these societies are not subjected to the struggle for the scarce resources of the Earth, known as dirty realism. Therefore, they do not agree with the way this type of cinema is presented as argued by Retamal (2022), nor are they characterized by fear, anxiety and threat (Pelea, 2022), but they do raise issues such as resource scarcity or the environmental problem as, for example, Wall-E. However, numerous stories have been found that, although they do not criticize the figure of intelligent robots, they show concern about technological

and scientific advances, advocating an environmental discourse and warning, through the narrative subtext, about some issues raised by the scientific determinism studied by Sannazzaro (2015), Masís, & Castro (2021), among others.

On the other hand, the presence of robots, androids or AI-dependent entities in these films does not entail that the narrative always places them as protagonists, since in 11 cases, the protagonists remain human, a feature that is consistent with the approaches of Asimov's novels. Nevertheless, it differs from his novels and much of science fiction cinema because the robots do not act as villains. It only occurs in the role of certain secondary characters identified as the bad guys of the movie, for example, the Rover Robot Model from *Planet 51*, Norm from *Phineas and Ferb*, Omnidroid 10 from *The Incredibles* or Deboraboth 5000 from *The Mitchells vs. the Machines*, in which the AI is clearly presented as a threat to the future of humanity or as a test to be overcome by the heroes.

Unlike films such as *I, Robot* (Proyas, 2004) or *Automata* (Ibáñez, 2014), the filmic narrative of the cases studied does not directly pose whether the AI complies with the laws of robotics from Isaac Asimov's novels. However, in most of the films that constitute the corpus, it is possible to affirm that these laws are fulfilled, since the robots are not conceived as violent but in favor of the welfare of the children starring in the films, by acting as a guardian, a companion or a hero. Generally, it is a faithful companion that helps transform and improve the main character's immediate environment, whether in the relationship with the parents, with the schoolmates or facing challenges when starting out in adulthood. In this regard, robots depicted without human features and with an oval shape, such as Baymax in *Big Hero 6*, B-bot in *Ron's Gone Wrong*, Eva in *Wall-E* or Clank in *Ratchet and Clank*, play this role of caregivers or helpers. In other cases, the robot imitates the human expressive and physical attributes, such as Rodney Copperbottom, Astro Boy, Jimmy Neutron, Ralph, Wall-E or 9, and they develop the role of a character searching for an identity and place in the world, as it happens in science fiction films, for example, the robot boy David in *A.I.: Artificial Intelligence* (Spielberg, 2001).

In this way, a worldview is consolidated with little presence of deep posthumanist elements, which provides the AI with qualities to carry out those activities related to care. It performs a similar accompaniment to that represented by some adult films that do not fit with the general and fatalistic vision of the technological singularity, as is the case of the robot Andrew in *The Bicentennial Man* (Columbus, 1999) or the robot created by the company Alterian in *Robot & Frank* (Schreier, 2021). Similarly, a narrative approach to AI is not linked to tragedy and death and, although in 9 cases there is a kind of rebellion of the machines, it is more on a philosophical level, with the robots deviating from the established order or in their process of becoming conscious, rather than in a struggle against humans.

In addition, Joseph Campbell's monomyth or hero's journey along with the plot themes (Balló, & Pérez, 1995) and classic themes (Durand, 2005) are repeated in most of the narrative patterns and structures. On the contrary, the subjugation in mechanical tasks of the AI has no place and, in fact, occupies the same place within the social stratum, not being confined to a merely instrumental or materialistic purpose. Similarly, in children's animation there is no substitution of the human being as a labor and economic asset, as Schofield (2018) suggests. However, although this approach of human otherness does not occur, they do suggest considerations about the feelings of robots, their awareness of existence and elements that refer to the question investigated by Gastaca, & Iturregui (2022) on the dichotomy of the robot as human-non-human.

Therefore, the findings after analyzing the films in terms of the variables and themes extracted from the specialized literature show that the themes and narrative patterns of these films are diametrically opposed to the traditional ones of science fiction films aimed at adults, especially those of the twentieth

century. Likewise, the intelligent robot in films for young people and children plays the role of a friend and a companion, a mentor, or even a heroic protagonist. Therefore, Generation Z imageries are not characterized by an AI that poses a danger to humanity (*2001: A Space Odyssey*, Kubrick, 1968), nor the end of the human species (*Terminator*, Cameron, 1984; *The Matrix*, Wachowski, 1999) or the replacement of the human being (*Blade Runner*, Scott, 1982; *A.I.: Artificial Intelligence*, Spielberg, 2001). On the contrary, in children's films they symbolize hope (*Wall-E*, Stanton, 2008), heroism (*Big Hero 6*, Hall, & Williams, 2014) or companionship (*Wreck-it Ralph!*, Moore, 2012). Elements that, according to the comparison of the results, it is believed to have contributed considerably to widen the gap between generations regarding the cultural imaginary about AI applied to robotics and, likewise, has entailed that the values determined and related to the role and integration of AI in everyday life and in close contexts entails different intergenerational attitudes and positionings. This fact is consistent with the data from the Trust in Artificial Intelligence: a global study (Gillespie et al., 2023) that fostered the interest of this research.

For a better understanding of the differences in imagery, the following table shows the main differences between adult science fiction films and those aimed primarily at young audiences. The comparison is based on the characteristics extracted from the literature review.

Table 4. *Differences and similarities found between the representation of AI applied to robotics in films for children versus films aimed at adult audiences.*

AI and robotics science fiction films	AI and robotics films for children/young audiences
Dilemma of the autonomy of machines (Viidalepp, 2020).	This dilemma does not arise, robots are autonomous entities.
Machine rebellion mytheme (Pérez, 2004; Ojeda, 2019; Masís, & Castro, 2021).	Robots, in general, do not pose a threat.
There is a clear scientific determinism (Sannazzaro, 2015; Masís, & Castro, 2021).	The stories are usually more friendly and optimistic.
They raise deep and complex ethical dilemmas about the rights of robots or the limits of technology (Sannazzaro, 2015).	They do not usually raise complex dilemmas.
It reflects on the ability of robots to feel and develop emotions versus human otherness (Schofield, 2018).	On the contrary, many plots are based on the friendship between humans and machines such as Baymax or Wall-E.
The plots are developed in dystopian and apocalyptic scenarios (Rodríguez, 2020; Masís, & Castro, 2021).	Dystopia does not have such a strong presence nor is it part of the central theme of the plot.
The representation of robots is varied, from adversaries, companions to protagonists (Pérez, 2004).	Although the representation is varied, the personification of robots as adversaries and antagonists is more scarce.
The designs, in general, tend to realism (Retamal, 2022).	The designs, on the other hand, tend to caricaturism, exaggeration and colorful style.
The theme of man versus machine or machine as the end of humanity is common in the sagas <i>Matrix</i> , <i>Terminator</i> or in films such as <i>Blade Runner</i> or <i>Automata</i> (Vidal-Mestre et al., 2023).	The myth of man versus machine is not typical of children's films. On the contrary, the robot and the human usually work as a team against a common enemy or threat.

The myth of Prometheus is very common in films such as <i>Terminator</i> , <i>Ex Machina</i> , <i>Blade Runner</i> or <i>I, Robot</i> . (Vidal-Mestre et al., 2023).	The Prometheus myth is reproduced in some films such as <i>Megamind</i> , <i>Astro Boy</i> and <i>9</i> but it does not have a parricidal character.
Posthumanism is a very popular topic. (Gastaca, & Iturregui, 2022; Fernández, 2021; Hidalgo, 2020).	Posthumanism is not usually present in children's cinema, although there are approaches such as kinder-than-human robots or bionic humans.
Robots have the capacity to learn, improve, evolve and develop feelings (Retamal, 2022).	Robots have the capacity to learn, improve, evolve and develop feelings.
Tension, conflict and ethical issues are central axes of the plots (Vidal-Mestre et al., 2023).	The plot is characterized by a more moralizing and pedagogical tone, as well as the reinforcement of values.

Source: Elaborated by the authors.

Finally, it should be added that this research is limited by the very organic nature of the medium, since film production is incessant and, in turn, is nourished by social and cultural issues, since not only are imageries generated from films, but they constantly reproduce social awareness and current issues. Therefore, it will be interesting to study in future research how the current influx of regenerative AI and its sociocultural expansion will affect the discourse of science and robotics applied to AI in animated films aimed at children in the coming years.

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