



Children's Science Fiction Cinema and Representations of Digital Technology: Between Educational Construction and the Reshaping of Perception

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Abstract :

This study aims to explore the relationship between technology and children's cinema by examining the representations adopted and promoted by science fiction films. This cinematic genre represents a symbolic space that is particularly appealing and accessible to child audiences, as it offers narratives and scenarios about the future of humanity in line with the technological development.

this study analyzes selected samples of science fiction films intended for children in order to identify the dominant representations conveyed. The study was carried by a qualitative content analysis as a detailed and systematic approach to uncover patterns and perceptions embedded in the communicative messages.

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1. Introduction :

Researchers view science fiction as a literary genre that focuses on narratives built around scientific or technological themes, emphasizing that its modern definition has become broader and more diverse. (Osawa, 2022, p. 2124)

Science fiction first emerged in literature and then rapidly transitioned to cinema starting from the year 1902. Since then, the relationship between literature and cinema has continued to evolve, with cinema benefiting from accompanying technical advances to enrich and expand the horizons of storytelling. This development has enabled the production of inspiring cinematic works characterized by strong visual aesthetics grounded in advanced digital technologies, allowing the depiction of other unfamiliar worlds. Science fiction films have also witnessed an evolution in narrative forms rooted in literary sources, whether through direct adaptations or indirect inspiration. Moreover, changes in production and distribution conditions within the audiovisual industries have contributed to the diversification and widespread dissemination of this cinematic genre. (Bréan, 17 | 2021, mis en ligne le 28 juin 2021, consulté le 05 mai 2025)

The popularity of science fiction cinema can be attributed to several factors, most notably scientific and technological progress, which has brought about radical transformations in traditional knowledge through revolutionary discoveries. Although classical works in this genre do not always adhere strictly to scientific accuracy, they have consistently introduced ideas about future technologies-such as robotics and space travel- thus opening broad chances for exploring radical and diverse capacities. Science fiction, as Osawa (2020) thinks, science fiction represents multiple worlds that differ conceptually, regarding planets

governed by alternative physical laws. These works often reflect societal reactions towards the emerging technologies, even when such advancements are fictional and unrealistic (Osawa, 2022, p. 2124).

This indicates that technology constitutes a central theme in science fiction films, as they seek to anticipate the status of technology and its relationship with society, making them a rich and compelling subject of academic inquiry-particularly when referring to examining representations of technology in science fiction cinema. Focusing on science fiction films directed to children is of particular importance, as this cinematic genre, despite its strong appeal to children and its ability to stimulate imagination and transport young audiences to different worlds, has not received sufficient scholarly attention. Studies addressing this genre for children have not yet adequately explore how young audiences receive these works, how such films help them decode symbols, understand the intersection of values with innovation and technology, and how they influence the shaping of this age group's social and technological future. (Eric, 2018, p. 1)

Given that the history of every communication technology is closely linked to the history of education, as noted by Bruno Olivier in his discussion of the interdependent relationship between the educational and communicational fields (Marty, les usages de l'audiovisuel éducatif par les enseignants face au numérique : l'exemple du site, 2015, p. 11). it becomes necessary to critically examine the content presented by cinema and to understand its potential effects on children, whether positive or negative. These films convey positive representations and educational messages by stimulating curiosity, adventure, and suspense, which capture children's attention and encourage future

engagement. They also serve as a source for shaping children's representations of their relationship with technology, emphasizing values such as friendship, justice, and courage, while encouraging innovation and a desire for exploration. Moreover, they enhance children's awareness of the influence exerted by invisible information systems on their lives and help them distinguish between right and wrong in their interactions with technology.

In this context, researchers Bonnie Tulloch and Eric M. Meyers, through their analysis of two Disney-produced films - *Big Hero 6* and *Zootopia* - argue that science fiction cinema constitutes an effective educational tool that can be leveraged to engage children and adolescents in discussions about representations of technology in the popular culture. Through these films, they address issues related to data analytics and its uses, commercial and personal technologies, and the role of information in the pursuit of justice. They also raise questions about the responsibility of citizens who, as a result of declining trust in institutions and the integrity of those who manage them, no longer feel obliged to act within the boundaries of the law (Eric, 2018, p. 1) Although the presence of effective and meaningful content in children's science fiction, cinema does not necessarily imply the absence of negative messages. Despite their exciting and appealing narratives, these films can also be confusing, as they blur the boundaries between reality and fiction, merge machines with social practices, and intertwine values with intelligent innovations. Ethical considerations and educational messages become entangled with technological developments, which

may influence children's perceptions of this new and complex phenomenon-one that even adults often struggle to fully comprehend. The significance of this medium in the production of meaning cannot be overlooked, as it mediates between the signifier and the signified, and even transcends traditional mediation to become a producer of a significant value-laden reality that exceeds the referential values it initially points to. In this regard, science fiction cinema has been described by Alain Boillat as a "world-building machine", capable of reshaping reality and constructing new images that blend imagination and reality in ways that profoundly affect the audience's consciousness, particularly that of children (Bréan, 17 | 2021, mis en ligne le 28 juin 2021, consulté le 05 mai 2025). This dynamic may place children in a state of fluctuation and confusion, as competing visual -value frameworks emerge - sometimes aligning with their social background, and at other times clashing with it in disruptive ways. This issue is particularly significant given that childhood represents a sensitive stage in the construction of an individual's value system, characterized by vulnerability and a high susceptibility to influence through prevailing behavioral patterns, whether via social modeling observation, alternative learning, or processes of reinforcement.

The complexity of this situation is further intensified by the urgent need to critically examine the content conveyed by these films, especially since the science fiction cinema industry directed to children is predominantly Western in origin. Its representations of technology often reflect external, globalized, and

culturally centralized perspectives. Such standardization imposes a one-dimensional model at the expense of diversity and cultural specificity, particularly in the absence of an authentic Arab film industry capable of offering alternative narratives about technology - largely due to high production costs and the complexities associated with production and distribution.

In this context, researcher **Istvan Csicsery-Ronay, Jr.** highlights the dynamics and boundaries of globalized science fiction, noting that cultural references often become so familiar that they do not create confusion for non-American audiences. This, in effect, denies the existence of technically distinct reception spaces, which could also serve as production spaces. Such a globalized pattern may locally give rise to imitative alternatives, with some national studios producing modified versions of English-language science fiction narratives and imagery (Bréan, 17 | 2021, mis en ligne le 28 juin 2021, consulté le 05 mai 2025).

From this perspective, the present study aims to explore the relationship between technology and children's cinema, shedding light on the methods and approaches through which technology is represented in science fiction films. It also seeks to analyze the role of these films as educational media that engage children in understanding and interacting positively with the world of technology, alongside examining potential negative content in these films that may convey misleading or distorted concepts regarding the capabilities of technology and the limits of its use.

This study is guided by the following central research question:
What are the representations of

technology in children's science fiction films within the study sample?

This main question is further divided into the following sub-questions:

- **What is the nature of the narrative presented in the films regarding technology?**
- **What types of technology are employed in the films?**
- **What stance do these films take toward technology?**
- **What positive educational messages do the films convey regarding children's relationship with technology?**
- **What negative messages do the films convey regarding children's interaction with the digital environment?**

2. Methodology

The study relies on a qualitative content analysis approach, suitable for examining the perceptions, representations, and implicit biases conveyed through visual texts. These texts shape audience understandings of technology, whether positively or negatively, explicitly or implicitly. In the context of films, these works function as communicative framing tools that reflect specific representations of technology, as well as underlying attitudes and judgments regarding its relationship with humans and society.

2.1. Study Population and Sample

The study population consists of all children's science fiction films in which technology constitutes a **central theme** within the narrative structure. The **study sample** was purposively selected, comprising **four films**, based on a set of scientific and objective criteria aligned with the research objectives, as follows:

-Centrality of Technology: Films were selected in which technology constitutes the primary theme, particularly those that

explore its relationship with society and the position of humans within a world governed or intersected by machines.

-Diversity of Age Groups: The sample was chosen to cover films targeting different age groups within childhood. This was clear through the age of the main protagonist and the analytical narrative context, allowing for an exploration of **representations of technology across varying levels of maturity and interests within each age segment.**

-Temporal Dimension and Technological Development: Films were selected to ensure representation of changes in the perception of technology over time, covering a period from 2007 to 2024. This approach allows for the analysis of how cinematic discourse toward technology has evolved across different historical contexts.

- Artistic Quality and Global prevalence: The sample was limited to films that received **international awards and recognition**, achieved high viewership, and generated substantial revenue. This criterion indicates their broad audience appeal while ensuring content richness both in terms of values and artistic quality. This aspect was considered to balance **commercial success with the educational or cultural messages** the films aim to convey.

3. Analytical Study

3.1. Analysis of the First Film

- Technical Profile of the Film: *Spy Kids 2: The Island of Lost Dreams* (2002)

This film expands the idea of using digital technology within an adventure

context, emphasizing children as independent protagonists capable of creatively interacting with technology.

- **Title:** *Spy Kids 2: The Island of Lost Dreams*
- **Director:** Robert Rodriguez
- **Year of Release:** 2002
- **Genre:** Action – Science Fiction – Aventure – Children
- **Duration:** 100 minutes

– Narrative Summary:

The film follows a new adventure of Carmen and Juni Cortez as they attempt to regain a highly dangerous device called the "Transmooker", capable of disabling all electronic devices. During their journey to a mysterious island inhabited by genetically modified creatures, they face both technological and natural challenges, while competing against another team of "spy kids".

– Type of Technology Used in the Film:

Type of Technology	Use
Electronic weapon	"Transmooker" device that controls electronic systems
Digital espionage tools	Advanced augmented reality glasses and additional espionage tools
Advanced vehicles	Advanced flying vehicles and small submarines designed for children
Biotechnology	Hybrid creatures genetically modified with technological tools

– Film's Stance on Technology:

- **Cautiously Positive stance:** Technology is presented as a means for

rescue and achieving success, but its use by villainous characters or without awareness also demonstrates potential risks. Human intelligence and ethical values must guide the use of technology to ensure positive good outcomes.

▪ **Positive Educational Messages Regarding Children's Relationship with Technology:**

▪ **Acceptance of Others and Non-Discrimination:** The film conveys implicit messages about **accepting differences** in appearance, behavior, and abilities. Even the island's unusual creatures are sometimes portrayed in a humanized way, reinforcing the value of **not judging others based on appearance**.

▪ **Empowerment of Children:** Children in the film do not rely solely on technological tools, but also on their intelligence and personal skills. **Technology is a powerful aid, yet it cannot replace human intellect.**

▪ **Innovation and Responsibility:** Advanced technology can be a danger or an opportunity, depending on who uses it. The film presents technology as a medium that stimulates discovery.

▪ **Ethical Values and Teamwork:** The film emphasizes that possessing advanced tools alone is insufficient for success or survival; humans must use technology wisely and integrate it with their abilities without blind dependence. It also highlights human values such as family cooperation, trust, and courage - which give technology its true value.

▪ **Autonomy:** The film focuses centrally on the concept of autonomy, illustrating

how this value enables children to "change the rules of the game" relying on their own abilities and personal skills without waiting for adult intervention or guidance. This is clearly demonstrated through child characters who take individual initiative and solve problems they faced independent of adult authority. This approach is appropriate for the film's target age group, as its protagonists are in late childhood - the stage Jean Piaget referred to as the "period of self-responsibility". At this stage, a child's moral rules are no longer dictated solely by external authorities (such as parents or teachers) but are built on **mutual agreement** among peers. In this regard, Autonomy represents a pathway for modifying prevailing moral principles or formulating new rules that emerge from the child's own experience and self-directed interaction. **Fraser and Bershel** argue that developing this moral understanding requires children to engage in social relationships that are not dominated by authoritative commands but rather provide space for free and independent thinking. Through interactions with peers in unconstrained environments, children develop the capacity to perceive the true function of ethics beyond mere coercive compliance (Bershe, 2012, p. 283).

- **Negative Educational Messages Regarding Children's Relationship with Technology:**

• **Elevation of Technology over Human Values:** Exceptional technological tools are portrayed as the source of the heroes' superiority rather than their moral or intellectual qualities. This can reinforce

the illusion that excellence depends on possessing tools rather than on effort or learning, which conflicts with the Arab educational system that emphasizes values and self - driven endeavor.

- **Moral Flattening:** Sometimes, the consequences of certain actions (e.g., lying, sneaking, or spying) are overlooked when they serve the "hero's interest". This may confuse children in distinguishing between means and goals, blurring their understanding of concepts such as honesty, integrity, and respect for privacy.

- **Creating a Gap Between the Child's and Adult's worlds:** Although the film emphasizes autonomy as a central element in the child's character development, portraying the hero as entirely independent of adults-relying solely on technology and peers-may widen the gap between the child and adult's authority and may reinforce the notion that children can replace adult guidance when guided by technological tools. As a result, the child will lack guidance and expertise in the real life. While the film does not completely ignore the family's role, its presence is delayed and marginal, with little impact on the narrative trajectory, which misrepresents the crucial role families play in reality. This depiction aligns with the American scholar Joseph Meyrowitz's argument that television has altered the very notion of childhood, as adult life will no longer hold secrets (Meyrowitz, 1995).

- **Oversimplification of Violence and Risk:** The film includes dangerous confrontations and violent events (albeit in a cartoonish style), yet the heroes overcome them effortlessly. This may weaken the sense of danger or obscure the

real-life consequences of hazardous actions, particularly in contexts lacking open discussions about distinguishing reality from fiction.

- **Reduced Patience for Gradual Learning:** In the film, crises are resolved in moments, which may instill in children **an aversion to lengthy learning processes** or perseverance, as "quick solutions" appear achievable.

2.3 Analysis of the Second Film:

– Technical Profile of the Film:

- **Title:** *Astro Boy*
- **Release Year:** 2009
- **Genre:** Science Fiction – Animation – Adventure – Family
- **Director:** David Bowers
- **Production:** Imagi Animation Studios
- **Distribution:** Summit Entertainment
- **Duration:** 94 minutes

– Narrative Summary:

Astro Boy film's events takes place in a futuristic world where **intelligent robots** coexist alongside humans. The film focuses on the character **Astro Boy**, a small robot with superhuman abilities, created specially to be a replica of **Toby**, the son of the scientist Dr. **Tenma**. After losing his son Toby in an accident, Dr. Tenma decides to create Astro Boy, an ideal version of his child, endowed with extraordinary powers such as immense strength, flight, and advanced artificial intelligence. **Astro Boy** must find his place in this world between humans and robots while fighting for **justice and**

humanity against **evil robots** that threaten the system.

– **Types of Technology Presented in the Film:**

Type of Technology	Use
Intelligent robots	Represents a major advancement in artificial intelligence, with robots programmed to perform multiple tasks and possess superpowers
Artificial intelligence	Astro Boy possesses advanced AI that allows him to learn and interact with humans
Space technology	The film features scenes set in space, utilizing advanced spacecraft

– **Film's Stance on Technology:**

• **Critique of Excessive Technology:**

The film also presents critiques of **unbalanced technological** use, showing how **advanced technology can lead to problems** if not used responsibly.

• **Use of Technology for Good:** The film demonstrates how **technology** can serve humanity, with **Astro Boy** as a prime example. The stance on technology in *Astro Boy* (2009) is nuanced and dual. It can be summarized as follows:

✓ **Critical Perspective:** Despite the extraordinary capabilities portrayed in the film, technology cannot replace human values such as love, loss, and identity. Dr. Tenma attempted to restore his son through technology but failed emotionally, highlighting technology's limitations in addressing human feelings.

✓ **Positive Perspective:** At the same time, technology is presented as a tool to achieve good, freedom, and life-saving. As a robot, Astro Boy demonstrates that technology can become a positive ethical

force if directed toward protecting the vulnerable and serving noble values.

✓ **Warning of Technology misuse:**

Through the character of President Stone, the film warns against using technology as a political weapon or a tool for domination, which can lead to corruption and destruction.

The film advocates for responsible and ethical use of technology, while acknowledging its enormous potential and the risks it poses if disconnected from human principles. **Although Astro Boy is a robot, he experiences emotions and a sense of identity, prompting the film to explore whether humanity is defined by biology or by feelings and choices.**

– **Positive Educational Messages:**

▪ **Promoting Human Values and Tolerance:** Through the character "*Astro Boy*", children learn that **humanity is not measured by appearance or origin but by actions and ethics**. This reinforces **acceptance of others and respect for differences**, which are crucial values in culturally and ethnically diverse Arab societies.

▪ **Encouraging Critical Thinking:** The film raises existential questions about identity, freedom, and emotions, potentially stimulating Arab children to engage in **critical and philosophical thinking**, especially in educational contexts that may rely heavily on memorization and rote learning.

▪ **Instilling the Importance of Resilience and Perseverance:** "*Astro Boy*" resists rejection and isolation, seeking his own identity and place in the world. This fosters **self-confidence** and the ability to overcome challenges,

particularly relevant in Arab societies facing social, political, or psychological difficulties.

▪ **Raising Awareness of Social Justice:**

The film critiques social and technological disparities between "Metro City" and the "Underground", cultivating an early sense of **justice, equality, and rejection of injustice** in children - a concept especially significant in communities experiencing social or economic gaps.

– **Negative Educational Messages:**

▪ **Potential Replacement of Humans with Robots:**

The film depicts a father replacing his deceased son with a robot, as if parental love could be redirected to an artificial substitute. This may confuse children regarding the unique value of an individual and reinforce the notion that emotions can be easily transferred to another "replica", thereby weakening the understanding of authentic human relationships. The researcher Hermann (2020) notes that artificial intelligence is often anthropomorphized or endowed with superhuman capabilities that exceed the technology's actual capacities, sometimes appearing almost magical, which can distort perception of reality. Lover (2020) emphasizes that taking science-fiction AI, capable of developing its own will, at face value overlooks the fact that machines lack intentions, reinforcing misconceptions about AI delegation or autonomy as prevalent in media discourse. (Hermann, 2023)

▪ **Violence as a Means of Conflict Resolution:**

The film relies on battle scenes and confrontations between robots, depicting Astro Boy using superhuman combat abilities against his opponents. This may instill in children the idea that

resorting to force and violence is the ultimate solution to problems, rather than dialogue or understanding. Researchers Divina Frau-Meigs and Jehel Sophie highlighted that the approach of normalization of violence on the child's screen and make it seems a natural ordinary promoted aspect can reveal a threatening cultural consequences on three levels: (Al-Ayyadi, 2011, p. 271)

✓ Glorifying and idealizing relationships based on power, turning them into preferred behavioral models.

✓ The tendency to view the world in a binary and superficial manner, which flattens thought and oversimplifies perspectives, reducing it into a distorted meaning. Thus, the world is classified into dualities, such as black and white, with no recognition of nuance or intermediate shades.

✓ Narrative impoverishment is also emphasized, with an excessive focus on visual and auditory effects at the expense of meaning.

3.3 Analysis of the Third Film:

– **Technical Profile of the Film:**

- **Title:** *Ron's Gone Wrong*
- **Original Title:** *Ron's Gone Wrong*
- **Release Year:** 2021
- **Genre:** Science Fiction – Animation – Comedy – Family
- **Directors:** Sarah Smith, Jean-Philippe Vine, Octavio Rodriguez
- **Production:** Locksmith Animation in collaboration with 20th Century Studios
- **Duration:** 107 minutes

– Narrative Summary:

The film is set in the near future, where personal robots known as "B-Bots" are widespread among children, serving as digital friends always connected to the internet. **Barney Pudowski**, a middle school boy, feels isolated as the only student in his school without a B-Bot. On his birthday, his father and grandmother gift him a refurbished robot named **Ron**. Barney discovers that Ron is malfunctioning, causing him to behave unpredictably and differently from other robots. Despite this, a unique friendship develops between them, and they embark on adventures full of challenges and comedic situations. As events unfold, the manufacturer "Bubble" realizes that Ron threatens its system and seeks to retrieve him. Barney must protect his new friend, highlighting the importance of true friendship in a world dominated by digital connectivity.

– Types of Technology Employed in the Film:

Type of Technology	Use
Personal robots (B-Bots)	Smart devices used as digital friends for children, always connected to the internet and collecting user data.
Artificial intelligence	Demonstrates how artificial intelligence can develop the capacity to express emotions and make independent decisions, as in the case of Ron.
Privacy and surveillance	The film addresses issues of data collection and user monitoring by technology companies.

– Film's Stance on Technology:

Representations of technology are central

in the film, highlighting several concepts regarding its impact on human relationships, particularly those involving artificial intelligence, robots, and social media. The film adopts a critical stance toward irresponsible use of technology, especially concerning privacy and its influence on social relationships, emphasizing the dominance of large corporations over technological products. Robots are depicted as machines that begin to control individuals' behaviors and actions, reflecting how major companies can shape people's lives.

At the same time, the film demonstrates that technology, when used responsibly, can enhance quality of life and foster true friendships. Personal robots (B-Bots) are portrayed as tools that facilitate communication, particularly among children. Their primary purpose is to help build friendships and social interaction in an environment excessively dependent on technology.

– Positive Educational Messages Regarding Children's Relationship with Technology:

▪ **Technology as a Tool for Enhancing Relationships:** Although the main character, Ron (the robot), is designed as a digital friend for children, the film emphasizes that real relationships cannot be replaced by technology. Through his journey with Barney, it becomes clear that the robot is not a substitute for real friends but serves as a supportive tool that enhances human relationships.

▪ **Appreciation of Imperfections and Learning from Mistakes:** "Ron" is a flawed robot who gradually learns to become a true friend. These imperfections create opportunities for growth and development. The film reinforces the idea

that mistakes are not permanent failures but opportunities to learn.

- **Honesty Over Perfection:** The film stresses that "Ron" is not a perfect robot, but he is sincere in his attempts to connect with Barney. Despite his technical flaws, the robot exhibits a real emotional development, instilling in children the importance of honesty in relationships and demonstrating that being truthful and realistic is more valuable than being flawless.

- **Flexibility in Facing Challenges:** "Barney" encounters difficulties in learning how to interact with new technology. The film shows that **flexibility** and adaptability help children overcome challenges; encouraging them to be resilient when facing technological changes or new situations to enhance the child's ability to cope with situations.

- **Ethical Values are more prominent than Technological Success:** The film highlights the importance of ethical values such as honesty, loyalty, and respect in contrast to the pressures of modern technology over the child and society. Children learn that human values remain more important than technological success, promoting a balance between the use of technology and adherence to ethical principles.

- **Negative Educational Messages Regarding Children's Relationship with Technology:**

- **Reinforcement of Emotional Attachment to Technology:** The film portrays the robot "Ron" as a caring, funny, and loyal character, which may lead Arab children to imagine smart devices (such as phones or voice assistants) as

substitutes for real-life relationships. Children might prefer interacting with machines over social engagement, particularly if they experience isolation or emotional voids.

- **Encouraging Identification with Western Digital Culture:** The film carries American values and lifestyle elements-school, relationships, personal technology, and individual freedom-which may not always align with social or familial norms in Arab contexts. This could create a sense of contradiction or rebellion in some children, prompting attempts to emulate the behaviors of a "Western digital child".

- **Downplaying the Risks of Excessive Technology Use:** Although the film criticizes tech companies for exploiting children's data, the depiction of robots as "ideal friends" implicitly reinforces the notion that AI should be a constant presence in children's lives. "Ron" monitors the child and knows all the details of his life, yet this is presented as something endearing. While the film hints at the negative effects of social media, its ending normalizes the child's relationship with technology through an "enhanced version" of the robot. This may convey to children that the solution lies not in moderating device use but in improving technology itself, weakening their critical awareness of its downsides.

- **Weakening Real-Life Communication Skills:** If Arab children identify strongly with the protagonist and his relationship with the robot, they may perceive interaction with devices as easier and less complex than communication with peers, particularly if they experience

shyness or bullying. This could impair linguistic, emotional, and social skills that are developed through authentic human interaction.

3.4. Analysis of the Fourth Film:

- Film Profile:

- **Title:** *The Wild Robot*
- **Director:** Chris Sanders
- **Release Year:** 2024
- **Genre:** Animation – Science Fiction – Adventure – Drama
- **Duration:** 102 minutes

- Narrative Summary:

The film revolves around "Roz" (ROZZUM 7134), a humanoid assistant robot who finds himself alone on a remote island after a Universal Dynamics cargo ship sinks. Initially, **Roz** is perceived as a threat by the local animals, but he gradually adapts to the new environment, learns the animals' languages, and begins forming relationships with them. During his adventures, Roz encounters a lone goose egg whose family was killed in an accident. When the egg hatches, Roz **adopts the gosling**, naming it "Brightbill", and becomes its father. Over time, Roz develops strong bonds with the other animals, becoming an integral part of the island's community.

However, when the manufacturer discovers Roz's presence, it sends a robot named "Vontra" to retrieve him. The animals unite with Roz to confront the threat, resulting in an epic battle that highlights the strength of the relationships Roz has built with his new friends.

- Types of Technology Featured in the Film:

Type of Technology	Use
Roz (ROZZUM 7134)	Humanoid assistant robot designed to perform tasks, capable of adapting to the natural environment and developing emotions.
Vontra	Advanced robot sent to retrieve Roz, representing the technological threat to the natural environment.

- Film's Perspective on Digital Technology:

The film presents a balanced view of technology:

- **Positive:** Through the character Roz, the film illustrates how technology can evolve and adapt to become an integral part of the natural environment, displaying empathy and emotional intelligence.
- **Negative:** Through the character Vontra, the film warns of the potential threats posed by technology when it is used without consideration for **human** and environmental values.

- Positive Educational Messages for Children Regarding Technology:

- **Fostering a Sense of Belonging and Acceptance of Differences:** Children may identify with Roz as a being different from its surroundings, helping those who feel isolated or alienated (due to bullying, shyness, or learning difficulties) to perceive difference as a strength.
- **Promoting Values of Coexistence and Tolerance:** The film presents a positive model of acceptance, as Roz is embraced by animals, which can instill in children humanistic values such as tolerance, acceptance of others, and cooperation-values particularly significant for Arab

children amidst social diversity and divisions.

- **Enhancing Adaptability and Resilience:** Through Roz, children learn that adapting to a new environment-even if complex or unfamiliar-is possible through learning, observation and patience. This value is especially relevant for Arab children facing significant social and educational changes in many Arab countries.

- **Raising Environmental Awareness:** The film depicts a harmonious relationship between "Roz" and nature, stimulating children's curiosity about living beings, the environment, and ecological balance. It encourages respect for animals and reflection on issues such as pollution and climate change, topics that are still underrepresented in Arabic-language content for children.

- **Instilling the Value of Care and Altruism:** Children learn from "Roz" concepts such as protection, nurturing, sacrifice, motherhood, and empathy-even from a non-human entity. This encourages the development of human empathy in a context where individualism and isolation are increasingly prevalent.

- **Encouraging a sense of learning and Exploration:** "Roz" observes, questions, learns from her environment, and applies knowledge, fostering children's curiosity for exploration and investigative skills rather than passive reception of information. This reinforces the notion - particularly for Arab children often exposed to traditional educational methods - that learning is a lifelong, experiential process.

- **Developing Ethical Thinking:** The film does not provide ready-made answers but places "Roz" in situations requiring complex moral decision-making -for example, whether to protect herself or others.

Such scenarios stimulate children's ethical imagination and foster him to think of "What is right?" and "Why?"

- Negative Messages for Children Regarding Technology:

- **Marginalization of the Family Role:** The idea of a "robot mother" may confuse children regarding concepts of motherhood, family, and affection, especially in Arab societies that highly value traditional family roles. The absence of positive human characters may also diminish children's appreciation of family or societal roles.

- **Forming Emotional Bonds with Machines:** the robot "Roz" is depicted as a nurturing, kind, sensitive, and loving substitute mother, which may instill in children the notion that machines can replace humans in key relationships (such as motherhood). This could weaken their understanding of "innate human love" and distort their perception of a natural family structure.

- **Idealizing Artificial Intelligence and Attributing Moral Qualities to It:** The machine learns from its mistakes, feels, sacrifices, errs, and corrects itself, blurring the line between humans and machines. This may foster the illusion that AI is an ethical or even morally superior entity, potentially weakening children's trust in human relationships and increasing their emotional dependence on technology.

▪ **Excluding the Role of Humans and Society:** There are no active human or social figures in the film; Roz learns and nurtures independently, without teachers, family, or community. This reinforces excessive individualism and detachment from the collective, potentially undermining traditional social bonds that characterize Arab societies.

▪ **Exaggeration of the Robot's Capabilities and Its Portrayal as an All-Encompassing Substitute:** The robot is depicted as capable of education, protection, medicine, agriculture, communication, and more. This promotes the idea that technology alone can solve all problems, which may reduce children's respect for human professional and social roles (teacher, mother, farmer, doctor, etc.).

▪ **Neglect of Human Values That Cannot Be Programmed:** The film does not address concepts such as the soul, faith, or internal values that cannot be acquired through programmed learning. This may lead children to believe that everything—even compassion, affection, and sacrifice—can be learned technologically, thereby stripping these values of their spiritual and cultural dimensions.

4. Discussion of Study Results:

Science fiction films vary in narrative content and plot details, yet they converge in presenting futuristic contexts centered around the theme of technology. These stories generally feature a playful tone and incorporate elements of comedy and narrative simplicity, which increase their appeal to audiences and enhance their influence. In this context, "Michel Souchon" notes, "This simplified vision

of life aligns with children's capabilities; pedagogically, it is inappropriate to present children with complex realities at an early age, as their understanding of things must be clear and specific" (Sushan, 2015, p. 114)

The study found that the types of technology depicted in science fiction films include: intelligent robots, space technology, electronic weapons, digital espionage tools, advanced vehicles, biotechnology, and artificial intelligence. These technological patterns share common traits: they possess rare skills and the ability to perform complex tasks, often serving as assistants to the hero or the threatening antagonists. In some films, robots are portrayed as benevolent and supportive entities, while in others they represent technological threats to humanity. These functions were particularly evident in films of the early 2000s; however, recent trends tend toward the approach of "humanization" of technology, depicting robots as human-like beings with emotions. This development reflects the social reimagining of technology alongside the evolution of science fiction filmmaking. "A study conducted by a group of authors, in collaboration with 15 experts from the "Japanese Association of Science Fiction and Fantasy Writers", was carried to discover the artificial intelligence functions. Ultimately, it identified three major functions of artificial intelligence in science fiction narratives" (Osawa, 2022):

- **Stories Exploring the Possibility of Extraterrestrial Intelligence:** These narratives explore diverse forms of

intelligence, including programs, robots, or beings from other worlds.

- **Stories Centered on Social Intelligence:** This category focuses on social interaction with intelligent entities.

- **Stories Addressing the Artificial Extension of Human Intelligence:** This type emphasizes enhancing human cognitive abilities through advanced human-machine interfaces, such as robots, the internet, or social networks.

4.1. Films' Stance toward Technology:

The films' attitudes toward technology in the study sample vary according to the chronological sequence of production and can be classified into three main patterns:

- **Cautiously Positive stance with Warnings of Risks:** This approach is evident in older films, where technology is presented as an effective means for rescue and achieving success, but it is accompanied by clear warnings about its misuse, whether by malevolent characters or in the absence of ethical awareness.

- **Balanced stance:** This perspective portrays technology as a tool that can serve humanity if used ethically and responsibly, yet it does not ignore the potential crises that may arise if it is employed recklessly. It also emphasizes that, no matter how advanced, technology cannot replace human values and emotions. This approach is clearly exemplified in *Astro Boy* (2009).

- **Optimistic stance toward Technology:** This trend appears in more recent films, where robots are depicted as advanced beings with emotional depth, capable of positive interaction with their

environment. Technology is no longer presented as a threat but as an active intermediary between the industrial and natural worlds. This reflects a contemporary vision in which technology is humanized and integrated into social and environmental life. This approach is prominently illustrated in *The Wild Robot* (2024), which presents a bold conceptualization that extends to blurring the borders between humans and technology.

4.2. Positive Educational Messages about Children's Relationship with Technology in the Study Sample:

Analysis of the films in the sample shows that they convey positive educational messages that reinforce a range of human and social values. These films focus on concepts such as tolerance, acceptance of others, and coexistence with differences, alongside empowering children and encouraging creativity. They also emphasize the importance of technological excellence paired with responsible use. Some films further address values such as teamwork, environmental awareness, moral development, and fostering a sense of belonging.

This perspective partly aligns with the findings of the researcher Hafiza Boukhari in her study on the values of American science fiction and their impact on the culture of Arab Muslim children. She analyzed films such as *Batman*, *Harry Potter*, and *The Philosopher's Man*, emphasizing that technology is not always utilitarian; it can carry ethical and human dimensions, encouraging empathy with others, the triumph of good over evil, and the reinforcement of the value of success. (Bukhari, 2012, p. 320)

4.3. *Negative Messages about Children's Relationship with Technology:*

Some films reflect a clear tendency to glorify technology at the expense of humans, presenting it as a central element superior to human intellect. This can negatively affect children's understanding of the human role in a machine-dominated world, weakening the real-life social interaction between individuals, fostering excessive attachment to machines, and creating a psychological and cultural gaps between children and the adult world. They tend to downplay or simplify the potential risks of technology, weakening children's critical caution, promoting a culture of expedition and velocity, and undermining the value of patience and gradual learning.

5. *Conclusion:*

Science fiction cinema serves as a powerful and influential medium in shaping children's perceptions of technology and regulating their relationship with it. It delivers both positive messages that reinforce human values and negative messages that may distort reality and obscure understanding of technology's limits and capabilities. Despite this influence, science fiction remains just one factor within a network of social and cultural forces that contribute to children's cognitive and moral development. Parental guidance, open family discussions, schools, and educational clubs play a decisive role in mediating children's reception of such content and fostering a more balanced and realistic understanding.

To reach the targets, the study proposes several practical recommendations:

- **Participation in Film Selection and Preparing Children for Viewing:** It is important that film viewing should not be

random or improvised. Instead, viewing sessions should be scheduled, and children should be cognitively and emotionally prepared to understand what they are about to watch. According to Salmon, children show greater engagement when the importance of the content is explained in advance, positively influencing their cognitive abilities and conscious interaction with the material. In this context, Lorenzo Velches emphasizes the need for parents to overcome preconceived biases against television and recognize it as an influential educational and cultural medium in a child's life (Mousa, 2011, p. 179)

- **Co-Viewing and Group Discussions:**

Studies indicate that watching films together with children enhances learning opportunities, develops language skills, and encourages children to ask questions and seek answers from sources beyond the screen, such as books and magazines, thereby broadening their knowledge horizon (Bershel, 2012, p. 26)

- **Encouraging Critical Discussion after Viewing:**

Post-viewing discussions are among the most effective ways to foster critical thinking in children. Questions such as "What is the difference between what we saw and reality? How do technological tools actually work? Is what was presented scientifically verifiable?" help connect imagination with the real scientific principles. Researchers Kyobi and Kaskztemehali stress the importance of equipping children with critical tools to understand and evaluate media content consciously (Gilbert, 2009, p. 388)

- **Encouraging Engagement in Real-World Technological Activities:**

Children should be encouraged to join scientific or technological clubs or follow programs highlighting real-life examples of talented individuals in these fields. Such involvement fosters positive interaction with technology and bridges the gap between fictional portrayals and scientific reality.

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