

Communication between Entities in Selected Short Stories of Ted Chiang

Ngoc Ánh Kieuová

Bachelor's Thesis
2025



Tomas Bata University in Zlín
Faculty of Humanities

Univerzita Tomáše Bati ve Zlíně

Fakulta humanitních studií

Ústav moderních jazyků a literatur

Akademický rok: 2024/2025

ZADÁNÍ BAKALÁŘSKÉ PRÁCE

(projektu, uměleckého díla, uměleckého výkonu)

Jméno a příjmení:	Ngoc Anh Kieuová
Osobní číslo:	H22525
Studijní program:	B0231P090005 Anglický jazyk pro manažerskou praxi
Forma studia:	Prezenční
Téma práce:	Komunikace mezi entitami ve vybraných povídkách Teda Chianga

Zásady pro vypracování

Shromáždění odborné literatury
Studium vybraných primárních děl
Stanovení cílů práce
Analýza zvolených primárních děl
Formulace závěrů

Forma zpracování bakalářské práce: **tištěná/elektronická**
Jazyk zpracování: **Angličtina**

Seznam doporučené literatury:

Hayles, Nancy Katherine. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press, 1999.
Keen, Suzanne. *Narrative Form*. 2nd ed. Basingstoke: Palgrave Macmillan, 2015.
Latham, Rob, ed. *Science Fiction Criticism: An Anthology of Essential Writings*. London: Bloomsbury, 2017.
Pinker, Steven. *The Stuff of Thought: Language as a Window into Human Nature*. New York: Viking Adult, 2007.
Wiener, Norbert. *Cybernetics: Or Control and Communication in the Animal and the Machine*. 2nd ed. Cambridge, MA: MIT Press, 1961.

Vedoucí bakalářské práce: **doc. Mgr. Roman Trušník, Ph.D.**
Ústav moderních jazyků a literatur

Datum zadání bakalářské práce: **2. ledna 2025**
Termín odevzdání bakalářské práce: **6. května 2025**

L.S.

Mgr. Libor Marek, Ph.D.
děkan

doc. Mgr. Roman Trušník, Ph.D.
ředitel ústavu

Ve Zlíně dne 24. února 2025

PROHLÁŠENÍ AUTORA BAKALÁŘSKÉ PRÁCE

Beru na vědomí, že

- odevzdáním bakalářské práce souhlasím se zveřejněním své práce podle zákona č. 111/1998 Sb., v platném znění bez ohledu na výsledek obhajoby;
- bakalářská práce bude uložena v elektronické podobě v univerzitním informačním systému a bude dostupná k nahlédnutí;
- jedno vyhotovení bakalářské práce v listinné podobě bude ponecháno Univerzitě Tomáše Bati ve Zlíně k uložení;
- na moji bakalářskou práci se plně vztahuje zákon č. 121/2000 Sb. o právu autorském, o právech souvisejících s právem autorským a o změně některých zákonů (autorský zákon) ve znění pozdějších právních předpisů, zejm. § 35 odst. 3;
- podle § 60 odst. 1 autorského zákona má Univerzita Tomáše Bati ve Zlíně právo na uzavření licenční smlouvy o užití školního díla v rozsahu § 12 odst. 4 autorského zákona;
- podle § 60 odst. 2 a 3 mohu užít své dílo – bakalářskou práci – nebo poskytnout licenci k jejímu využití jen s předchozím písemným souhlasem Univerzity Tomáše Bati ve Zlíně, která je oprávněna v takovém případě ode mne požadovat přiměřený příspěvek na úhradu nákladů, které byly Univerzitou Tomáše Bati ve Zlíně na vytvoření díla vynaloženy (až do jejich skutečné výše);
- pokud bylo k vypracování bakalářské práce využito softwaru poskytnutého Univerzitou Tomáše Bati ve Zlíně nebo jinými subjekty pouze ke studijním a výzkumným účelům (tj. k nekomerčnímu využití), nelze výsledky bakalářské práce využít ke komerčním účelům;
- pokud je výstupem bakalářské práce jakýkoliv softwarový produkt, považují se za součást práce rovněž i zdrojové kódy, popř. soubory, ze kterých se projekt skládá; neodevzdání této součásti může být důvodem k neobhájení práce.

Prohlašuji, že

- jsem na bakalářské práci pracoval(a) samostatně a použitou literaturu jsem řádně citoval(a); v případě publikace výsledků budu uveden(a) jako spoluautor;
- odevzdaná verze bakalářské práce a verze elektronická nahraná do IS/STAG jsou obsahově totožné.

Ve Zlíně, dne

.....

podpis autora

ABSTRAKT

Tato bakalářská práce se zabývá komunikací mezi entitami zobrazenými v povídkách Teda Chianga „Příběh tvého života“, „Pochopit“ a „Životní cyklus softwarových objektů“ s cílem identifikovat rozdíly v komunikaci napříč těmito příběhy. Pomocí Lasswellova modelu komunikace jsou vybrané úryvky z povídek analyzovány podle příslušných prvků modelu, konkrétně komunikátora, sdělení, média, příjemce a účinku. Na základě analýz byly zjištěny rozdíly v každém prvku modelu, přičemž nejzřetelnějším rozdílem je v účinku. Příběhy v konečném důsledku ukazují, že ke komunikaci dochází při aktivním zapojení obou stran, což vede ke změně entit. Zdůrazněním těchto rozdílů v povídkách přispívá tato bakalářská práce k probíhající diskusi o komunikaci mezi entitami v literárním žánru science fiction.

Klíčová slova: komunikace, entita, kyberkultura, Lasswellův model komunikace, Ted Chiang, povídka, literární analýza

ABSTRACT

This bachelor's thesis explores communication between entities portrayed in selected Ted Chiang's short stories "Story of Your Life," "Understand," and "The Lifecycle of Software Objects," aiming to identify differences in communication within these stories. Using Lasswell's communication model, chosen excerpts from the short stories are analysed according to the appropriate elements of the model, namely the communicator, message, medium, receiver, and effect. Based on the analyses, differences were observed in every element of the model, with the effect being the most evident difference. Ultimately, the stories demonstrate that communication occurs when both parties actively engage, leading to the entities being altered. By highlighting the differences, this bachelor's thesis offers a perspective on the ongoing discourse regarding communication between entities within the science fiction literary genre.

Keywords: communication, entity, cyberculture, Lasswell's model of communication, Ted Chiang, short story, literary analysis

CONTENTS

INTRODUCTION	11
1 HISTORICAL CONTEXT TO SCIENCE FICTION	13
1.1 THE EARLY STAGES OF SCIENCE FICTION	13
1.2 CHANGE IN PRINCIPLES	13
1.3 CYBERCULTURE	16
2 COMMUNICATION	19
2.1 HUMAN COMMUNICATION	19
2.2 CONNECTION BETWEEN NONHUMAN ANIMALS AND OTHERS	19
3 STORY OF YOUR LIFE.....	23
3.1 FIRST ENCOUNTER WITH HEPTAPODS.....	23
3.2 COMMUNICATION MEDIA	25
3.3 SENTENCE STRUCTURE	26
3.4 THE HEPTAPODS' INFLUENCE ON COMMUNICATION EFFECTIVENESS	28
3.5 CHANGE IN CHARACTER	30
3.6 TRANSFORMATIVE EFFECT.....	31
4 UNDERSTAND	32
4.1 SUPERHUMAN AND HUMAN.....	33
4.2 PROTAGONIST'S REALISATION	35
4.3 DESTRUCTIVE EFFECT	38
5 THE LIFECYCLE OF SOFTWARE OBJECTS.....	40
5.1 THE DIGIENTS' CHARACTER	40
5.2 ADVANTAGES OF VIRTUAL REALITY.....	42
5.3 ENTITIES' EMOTIONS	44
5.4 DIGIENTS' PURPOSE	46
5.5 EMOTIONAL EFFECT.....	49
CONCLUSION	51
BIBLIOGRAPHY.....	53

INTRODUCTION

Communication has always been an essential part of life. However, this contact may not be exclusive to humans. Since ancient times, questions concerning encounters with non-human beings have been raised. In connection, science fiction explores this idea in greater detail as it is one of the most popular types of storytelling used today, including alien encounters, technological advancements, and dystopian societies. Furthermore, the theme of technological advancement was prominent in the popularisation period of Cyberculture at the end of the 20th century.

Ted Chiang, American author of contemporary science fiction short stories, is known for combining the fantastic with technological aspects. He published his first short story in 1990 for *Isaac Asimov's Science Fiction Magazine*, and later on, his short stories were converted into two collections, *Stories of Your Life and Others* (2002) and *Exhalation: Stories* (2019). The first collection has been translated into twenty-one languages, and the title story has been reworked into a movie, *Arrival* (dir. Denis Villeneuve, 2016), which was nominated for the Oscar, and the latter was determined as one of the 10 Best Books of the same year of its publication.¹ In the same year, Ted Chiang won the Nebula Award – an annual recognition for the best work of science fiction – and in the following years, he won an additional three Nebula Awards and six Locus Awards.² Recently, Ted Chiang contributed an essay, “Why A.I. Isn’t Going to Make Art,” to *The New Yorker* 100.³ Ted Chiang explores the role of language in unusual situations and how the use of technology impacts society. Ultimately using these themes as a setting for his stories. The settings place human characters into an unfamiliar situation, from which the characters must reevaluate their understanding of reality, leading to the transformation of human nature.

To gain a further insight into communication featured in science fiction stories of this era, the primary goal of this thesis is to identify differences in communication among humans and other beings in Ted Chiang’s short stories “The Story of Your Life,” “Understand,” and “The Lifecycle of Software Objects.” Each short story presents an unusual interaction between entities: “The Story of Your Life” focuses on a human protagonist communicating

¹ “Ted Chiang,” Profile, Santa Fe Institute, accessed February 11, 2025, <https://www.santafe.edu/people/profile/ted-chiang>.

² “Ted Chiang,” Authors, Pan Macmillan, accessed February 11, 2025, <https://www.panmacmillan.com/authors/ted-chiang/2417>.

³ “Why A.I. Isn’t Going to Make Art,” The Weekend Essay, The New Yorker 100, accessed February 13, 2025, <https://www.newyorker.com/culture/the-weekend-essay/why-ai-isnt-going-to-make-art>.

with aliens, “Understand” is centred around a human with heightened brain power who communicates with humans and an individual with similar powers, and “The Lifecycle of Software Objects” focuses on humans communicating with digital organisms.

For analysing each short story, Harold Lasswell’s model of communication is applied and used as a framework. This model contains the following elements: communicator (who is speaking), message (what content is being communicated), medium (by which channel), audience (originally a group of receivers), and effect (the outcome of the message). The term “entity” is further used as an umbrella term for human and nonhuman animals, as well as other species, namely aliens, digital organisms, and superhumans. The short stories are divided into chapters, which mark the important events, and are accompanied by analysed excerpts structured according to the model of communication. Furthermore, the analyses of the stories are compared to the elements of the model, highlighting patterns and distinctive features. By identifying the differences, this thesis seeks to aid further insight into the perception of communication between entities in Cyberculture.

1 HISTORICAL CONTEXT TO SCIENCE FICTION

To gain a better insight into the works of Ted Chiang, it is essential to examine the development of science fiction (SF). This genre focuses on hypothetical, scientific and technological concepts experiencing its surge in popularity throughout the last century. The setting of SF stories is generally set in alternative realities, the future or space. As the name suggests, the plots are fictional and speculative. Additionally, they require a level of technological or scientific explanation of the situation for the reader to understand the essential rules of the environment. These principles are accompanied by traditional rules for narration, which are mentioned in the *Oxford English Dictionary*, containing “a history, tale, story, recital (of facts, etc.),” to which Suzanne Keen adds that these rules are applicable to fiction as well.⁴

1.1 The Early Stages of Science Fiction

According to Stableford, a SF writer, these imaginary stories were typically depicted as imaginary voyages, which became a pattern starting with Francis Bacon’s *New Atlantis* in 1627.⁵ However, scientific explanations were not the common method used before the 20th century. Stableford notes that between the 17th and 18th centuries, stories which included travelling in space and into the future were achieved through dreaming because there was a lack of narrative tools, which would effectively explain the fantastical aspect of the stories.⁶

As highlighted by Stableford, the idea of space travel was prevalent until the mid-18th century, as in 1752, Voltaire’s *Micromégas*. Portrayed entities from the planets Sirius and Saturn visit the Earth, which is a revolutionary idea for his time. Moreover, Voltaire’s stories – *contes philosophiques* – faced challenges regarding storytelling, as the rigid structure did not allow for deeper exploration. As a result, the characters felt unnatural.⁷

1.2 Change in Principles

SF faced a major obstacle: how else could authors clarify to readers the imaginary scenarios in SF stories other than by dreaming about them? In Stableford’s view, Edgar Allan Poe was one of the first experimental writers, who combined science and literature, namely his poetic

⁴ Suzanne Keen, *Narrative Form*, 2nd ed. (Basingstoke: Palgrave Macmillan, 2015), 1.

⁵ Brian Stableford, “Science Fiction Before the Genre,” in *The Cambridge Companion to Science Fiction*, ed. Edward James and Farah Mendlesohn (Cambridge: Cambridge University Press, 2003), 15.

⁶ Stableford, “Genre,” 16-7.

⁷ Stableford, “Genre,” 17-8.

essay “Eureka,” which incorporated astronomical telescopes.⁸ Additionally, an American writer, Hugo Gernsback, acknowledged Poe as “the father of scientifiction. It was he who really originated the romance, clearly weaving into and around the story, a scientific thread.”⁹ In addition, through Poe’s work, a French writer, Jules Verne, found out that imaginary voyages provided scientific exploration, consequently creating *From the Earth to the Moon* in 1865, in which he mentioned hypothetical locomotive technologies.¹⁰

As SF became more known to the public, a new fiction magazine, *Amazing Stories*, emerged in 1926. According to Gernsback, this magazine consisted of stories similar to Poe’s and Verne’s, stories that were deeply connected to scientific facts and prophetic vision. Additionally, sister magazines *Science and Invention* and *Radio News* were following the same path.¹¹ The introduction of magazines is explained by Adam Charles Roberts, a British writer of SF and fantasy. He claims that due to the high price of books, people resorted to printing cheaper and more accessible alternatives – pulps – magazines made out of wood pulp. However, in contrast to Gernsback, Roberts notes that a magazine, *The Argosy*, published in 1886, was the first magazine to contain a SF story. Furthermore, Roberts states that although Gernsback was one of the prominent figures to publish SF magazines, his vision was to embed strictly scientific accuracy, while omitting the fantastic and supernatural elements of SF. Provided the audience of these magazines was diverse and the readers wanted the missing aspects, his vision was modified, which allowed the genre to expand.¹²

The magazine era remained popular until 1940, when another period of SF began, titled the Golden Age, which lasted for twenty years. According to Roberts, this era was significant for its use of “hard science fiction” writing, meaning the emphasis was put on “physics of space travel or interstellar warfare.”¹³ One of the important editors for Gernsback’s pulp was John Wood Campbell Jr., who later published *Astounding Science Fiction* magazine. In this magazine, the use of hard science fiction was emphasised, accompanied by male-focused protagonists solving problems. Later on, the stories included a new phenomenon concerning pseudo-sciences: telepathy. In addition, themes such as new technology and its impact on

⁸ Stableford, “Genre,” 18.

⁹ Hugo Gernsback, “Editorial: A New Sort of Magazine,” in *Science Fiction Criticism: An Anthology of Essential Writings*, ed. Rob Latham (London: Bloomsbury, 2017), 11.

¹⁰ Stableford, “Genre,” 20.

¹¹ Gernsback, “Magazine,” 11.

¹² Adam Charles Roberts, *The History of Science Fiction*, 2nd ed. (London: Palgrave Macmillan, 2016), 254–7.

¹³ Joan Slonczewski and Michael Levy, “Science Fiction and the Life Sciences,” in *The Cambridge Companion to Science Fiction*, ed. Edward James and Farah Mendlesohn (Cambridge: Cambridge University Press, 2003), 174.

humans were included.¹⁴ However, Jess Nevins, an American writer, notes that pulp writers avoided contributing to SF pulps due to the limitations of Campbell's view on the principle of SF focusing on the technology and its influence on society. He further elaborates that owing to the decline of general pulps, pulp writers shifted their attention to other genres. Although the appearance of science fiction themes in general pulps decreased, designated science fiction pulps remained stable, together with romance pulps, compared to other pulps in the years 1950 to 1953.¹⁵

Considering SF as a genre, it was not restricted to using solely pulps as a medium of storytelling. Jay P. Telotte, a professor of literature, communication, and culture, comments on the relation of the rise of radio and television and the development of science fiction, while referring to Gernsback and his commentary on television and radio as a medium for sharing SF stories. He also mentions Jeffrey Sconce's, a professor and cultural historian of media and film, note about "the emergence of uncanny electronic texts."¹⁶ Moreover, as televisions and radios were common devices in standard households, they played a role in the change of science fiction perception. Telotte further highlights the importance of George Orson Welles's broadcast – an adaptation of *The War of the Worlds* by Herbert George Wells – in 1938, which stirred a mass panic. Although the public was warned, the panic was repeated a few years later in Chile and Ecuador, where it was broadcast. These events proved the significance of radio's power and the connection between science fiction and reality.¹⁷

Regarding televisions, Susan Sontag, an American writer, focuses on the SF aspects in films. She argues that there is a difference in media, comparing science fiction stories in films and novels. She further states that "the best science fiction movies are on a far higher level."¹⁸ The beginning of science fiction cinema is outlined by Roberts, who states that it took place in the 1940s.¹⁹

Following the growing appearances of SF, in America, the first fandoms of science fiction were created. Farah Mendlesohn, a British writer on speculative fiction, provides an example of fandoms, such as Science Fantasy Society and San Francisco Science Fiction

¹⁴ Roberts, *The History of Science Fiction*, 287.

¹⁵ Jess Nevins, "Pulp Science Fiction," in *The Oxford Handbook of Science Fiction*, ed. Rob Latham (Oxford: Oxford University Press), 98-9.

¹⁶ Jay P. Telotte, "Radio and Television," in *The Oxford Handbook of Science Fiction*, ed. Rob Latham (Oxford: Oxford University Press), 169.

¹⁷ Telotte, "Radio and Television," 170.

¹⁸ Susan Sontag, "The Imagination of Disaster," in *Science Fiction Criticism: An Anthology of Essential Writings*, ed. Rob Latham (London: Bloomsbury, 2017), 191.

¹⁹ Roberts, *The History of Science Fiction*, 320.

Conventions Inc. Furthermore, she believes that regarding Europe, Sweden was the first to have an established fandom since the 1950s, and later in 1972, the first group in continental Europe was in Trieste, Italy.²⁰

Building on the previous mention of televisions, the events of the 1960s had a profound impact on the world and science fiction. As expressed by Damien Francis Broderick, an Australian fantasy writer, after the landing of Apollo on the Moon in 1969, and the assassination of President Kennedy in 1963, people realised that previously thought of as a “mere science fiction,” it showed a realistic image, shared across the world.²¹ To which Roberts builds on this statement, that due to the NASA Apollo, a rising hope in people was evident. However, he further reports that in ten years, because of insufficient funding, the projects in space were limited, thus the hope of people was declining.²²

1.3 Cyberculture

The turning point occurred in the 1980s, beginning with the appearance of the Internet. Communication between people was faster, and with that, the potential risks associated with its use increased. Ted Chiang published his first short story, “Tower of Babylon,” in 1990 in *Omni* magazine, thus falling within the cyberculture period. To underline the significance of science fiction during this period, it is important to highlight its historical foundations in cyberculture.

Regarding online communication, Mark Dery, an American writer and cultural critic, writes that “Flame wars, in compu-slang, are vitriolic online exchanges,” which limits the extent of human communication to text, thus leading to intensified conflicts. He further refers to Peter Farb, an American linguist, who comments on the importance of paralanguage, the presence of “vocal phenomena such as pitch, intensity, stress, tempo, and volume,” in effective communication. These vocal phenomena help ensure the communication is interpreted without misunderstandings – elements that are missing in online interactions.²³

²⁰ Farah Mendlesohn, “Fandom,” in *The Oxford Handbook of Science Fiction*, ed. Rob Latham (Oxford: Oxford University Press), 72-3.

²¹ Damien Broderick, “New Wave and Backwash: 1960-1980,” in *The Cambridge Companion to Science Fiction*, ed. Edward James and Mendlesohn Farah (Cambridge: Cambridge University Press, 2003), 48.

²² Roberts, *The History of Science Fiction*, 333.

²³ Mark Dery, ed., *Flame Wars: The Discourse of Cyberculture* (Durham: Duke University Press, 1994), 1-2.

Dery expands his commentary in *Escape Velocity* (“the speed at which a body – a spacecraft, for instance – overcomes the gravitational pull of another body, such as the Earth”²⁴), where he metaphorically suggests that cyberculture is reaching the “escape velocity” of physical reality, due to people spending increasing amounts of time online. In addition, aside from computers, the rapid development of technology, namely microprocessors in microwave ovens and car engines, changed the way of life.²⁵

In the wake of a changing society, science fiction authors incorporated this dynamic in their works. Bruce Sterling, an American writer of science fiction, lists the names of prominent authors of this period, such as Alfred Bester, Thomas Pynchon and Philip Kindred Dick. What these authors have in common, according to Sterling, is “they love to grapple with the raw core of SF: its ideas.”²⁶ In other words, the authors used the traditional SF features in their writings. He further highlights that cyberpunk (the term coined by Bruce Bethke as a title of a short story in *Amazing Stories* in 1983²⁷) authors are the first generation to live in a “science-fictional world,” therefore, the ideals of hard science fiction are more than a literary method for them. Furthermore, his view is similar to Dery’s on the fact that the impact of technology was noticed by ordinary people because its presence was physically close to them, to which Sterling draws an example on personal computers and portable telephones.

Aside from technology, the dominant themes of cyberpunk, according to Sterling, were body invasion and mind invasion, which included subthemes, such as “brain-computer interfaces, artificial intelligence, [and] neurochemistry.”²⁸ Additionally, according to David Bell, an American writer and English professor, the connection between cyberpunk, a SF subgenre, and cyberculture identity lies within their theme: a life in cyberspace (“an imagined space between computers in which people might build new selves and new worlds”²⁹).³⁰

With major themes listed, it is apparent that Ted Chiang fits within this period, as his works incorporate some of its defining themes. The chosen selection of Ted Chiang’s short

²⁴ Mark Dery, *Escape Velocity: Cyberculture at the End of the Century* (New York: Grove Press, 1996), 3.

²⁵ Dery, *Escape Velocity*, 3-8.

²⁶ Bruce Sterling, “Preface to Mirrorshades: The Cyberpunk Anthology,” in *Science Fiction Criticism: An Anthology of Essential Writings*, ed. Rob Latham (London: Bloomsbury, 2017), 38.

²⁷ Roberts, *The History of Science Fiction*, 439.

²⁸ Sterling, “Preface to Mirrorshades: The Cyberpunk Anthology,” 40.

²⁹ David Bell, *An Introduction to Cybercultures* (New York: Routledge, 2001), 7.

³⁰ Bell, *An Introduction to Cybercultures*, 3, 21.

stories (“Understand” and “The Lifecycle of Software Objects”) showcases artificial intelligence, neurochemistry, and its impacts on a human character, as well as cyberspace. Additionally, the exploration and use of technology remain the main themes in “Story of Your Life.”

2 COMMUNICATION

Communication is crucial for the everyday functioning of society. It varies, from conversations between humans to interactions between humans and animals or artificial intelligence. To better understand Ted Chiang's short stories, which contain the varieties mentioned, it is important to outline the key variations of entities' communication.

2.1 Human Communication

The first variation to be mentioned is communication between humans, which works based on using language and non-verbal aspects simultaneously in context. In the words of Zhana Reznikova, a professor of behavioural ecology, language itself is a complex communication system with thousands of spoken and written forms that convey ideas.³¹ Additionally, as explained by Ton Dijkstra, a psycholinguistics professor, and David Peeters, an associate professor in the Department of Communication and Cognition, humans use all sensory channels, which improve communication.³² These include the visual, auditory, kinaesthetic, olfactory, and gustatory senses. These two statements combined establish a broader framework for the fundamentals of human communication.

2.2 Connection between Nonhuman Animals and Others

The next variation to be considered is the communication between humans and nonhuman animals. Historically, communication between humans and animals has been a subject of debate. Although animals do not possess the ability to create new sentences in human language, there are cases where humans talk to animals and animals talk back in animal language.

According to Reznikova, the terms "communication and signalling" in animal studies take on the same meaning. Furthermore, the term "language behaviour" is mentioned when animals use signals similar to words in human language. These signals may contain a piece of information which describes external surroundings, and are in this case called "functionally referential." The examples mentioned consist of data about potential predators or the location of food.³³ Considering that animals use communication differently from

³¹ Zhanna Reznikova, *Studying Animal Languages without Translation: An Insight from Ants* (Cham: Springer), 5.

³² Ton Dijkstra and David Peeters, *The New Psychology of Language: From Body to Mental Model and Back* (New York: Routledge, 2023), 17.

³³ Reznikova, *Studying Animal Languages Without Translation*, 7.

humans, fiction authors experiment with creative communication strategies regarding nonhuman animals in their works.

The representation of animals' emotions has been portrayed in literature before, however, David P. Rando, an English professor, states that a unique technique of representing animals beyond traditional human-centred views is used. This technique is applied to challenge readers and their opinions on nonhuman animals.³⁴ He argues that science fiction and related hybrid genres explore new perspectives by incorporating the technique of depicting nonhuman animals in alternative ways, mainly focusing on "hope." Additionally, he draws an example on two novels: *Never Let Me Go* by Kazuo Ishiguro, where clones are created to donate organs, and *Do Androids Dream of Electric Sheep?* by Philip K. Dick, where a bounty hunter eliminates androids. By featuring entities instead of nonhuman animals in these novels, the authors avoid traditional storytelling styles. Furthermore, this depiction of nonhuman entities allows readers to reevaluate whether hope is limited only to humans.³⁵

Frans de Waal, a primatologist and an ethologist, takes a different perspective, highlighting the refusal of "humanlike characteristics in other animals or animallike characteristics in humans," which he calls *anthropodenial*.³⁶ However, in Rando's view, *anthropodenial* distorts human perception of animals and prevents humans from relating to nonhuman animals.³⁷

Much is known about interactions between humans and nonhuman animals, especially in SF featuring other entities with animal-like traits. However, less attention has been paid to interactions between humans and creatures – nonhumans and nonanimals – with a higher level of intelligence. As expressed by Rando, modern fiction poses questions on how the term "posthumanism" should be identified regarding its connection to nonhuman animals. He illustrates an example of Donna Haraway's depiction of a cyborg and the idea of a "play of companion species," which suggests a relationship between various entities.

Nevertheless, a question remains whether the creatures in stories can be considered as alternatives for nonhuman animals. As observed by Norbert Wiener, an American

³⁴ David P. Rando, *Doing Animal Studies with Androids, Aliens, and Ghosts: Defamiliarizing Human-Nonhuman Animal Relationships in Fiction* (London, Bloomsbury Academic, 2023), 21-2.

³⁵ Rando, *Doing Animal Studies*, 21-3, 26.

³⁶ Frans de Waal, *Are We Smart Enough to Know How Smart Animals Are?* (New York, W. W. Norton, 2016), 319.

³⁷ Rando, *Doing Animal Studies*, 23.

mathematician, there is a close connection between living organisms and mechanical systems. He draws an example of two patients suffering from losing full control of the body's movement, known as "ataxia." This condition requires functioning effectors, which must be tracked and reported to the central nervous system. In addition, other organs' sensory input must be compatible with the report for the output to be sensible.³⁸ Compared to Wiener's observation, Katherine Hayles, a postmodern literary critic, addresses the difficulties of perceiving artificial life or computer codes as living and natural. She states that the answer depends on assumptions, which are deeply intertwined with other formulations and cultural ideas. Given this complexity, Hayles suggests focusing on "the scientific content of the programs" and "the stories told about and through them."³⁹ These assumptions change depending on the period in which the technology has reached a level of advancement, and the story was written. Bearing this in mind, the realistic approach to perceiving other entities, except humans and animals in science fiction stories, as alternatives seems to depend on the reader.

In literature, especially in science fiction, it is often the case that the main theme of the story is first explored from a theoretical and philosophical perspective before pointing out the correlation to the real world. Building on Hayles's theory, how much a reader makes a connection between science fiction and the present reality depends on how closely the characters' traits and setting description resemble either real life or a potential future. In addition, the personal perception of a reader plays a crucial role in the interpretation of a story.

Steven Pinker, a Canadian American cognitive psychologist and psycholinguist, believes that human thinking is naturally able to recognise concrete concepts such as "sights and sounds, objects and forces, and the habits of behavior and emotion in the culture we grow up in." However, abstract ideas are processed as metaphorical thinking. Furthermore, Pinker highlights that to understand an abstract topic – a metaphor – it must be analysed and then understood.⁴⁰ With a connection to Pinker, the method in which Ted Chiang illustrates the short stories is in the form of metaphors. "Story of Your Life" is a metaphor for the Sapir-Whorf hypothesis, a "linguistic relativity, which asserts [...] that language determines the

³⁸ Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (MA: MIT Press, 1961), 96.

³⁹ Nancy Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 224.

⁴⁰ Steven Pinker, *The Stuff of Thought: Language as a Window into Human Nature* (New York: Penguin Books, 2008), 238.

way people perceive and organize their worlds.”⁴¹ “Understand” is a metaphor portraying the lust for enlightenment at the cost of humanity, and “The Lifecycle of Software Objects” is a metaphor for human resilience. All mentioned metaphors are experienced by the protagonists throughout the narrative, influencing their behaviour, resulting in character development. Furthermore, regarding the use of communication between entities in Ted Chiang’s short stories, he creatively combines the realistic aspects of linguistics (the Sapir-Whorf hypothesis that language influences perception, and language acquisition phenomena in children) with elements of traditional science fiction storytelling (alien encounters and technological advancements).

⁴¹ David Krystal, ed. *A Dictionary of Linguistics and Phonetics*, 6th ed. (Malden, MA: Blackwell Publishing, 2008) 411.

3 STORY OF YOUR LIFE

This section examines how Ted Chiang employs communication between humans and species with higher intelligence. “Story of Your Life” revolves around a human protagonist, Dr. Banks, interacting directly with alien species called “heptapods.” The story begins with Dr. Banks being approached by Colonel Weber and Dr. Gary Donnelly requesting to listen to an alien recording. At that moment, she is already aware of their appearance. She listens to the recording, and the Colonel asks her about any detectable linguistic properties. Dr. Banks fails to recognise anything. In her eyes, she would be able to learn the alien’s language only by interacting with them. Therefore, with consent, Dr. Banks is relocated to the Army’s encampment, whose location is not specified, to conduct further research and decipher the language at one of the tents, where the entities are residing.

With each interaction, Dr. Banks unfolds the core principles of their thought process. Additionally, after acquiring the ability to write in their language, Dr. Banks perceives time as the heptapods do. This causes her to have glimpses of her future events, and later on, changes her awareness. This evolving power allows her to foresee her daughter’s life, to whom the story is addressed. Dr. Banks concludes that the heptapods have more advanced technology and thought processes than humans. The officials are exchanging knowledge with them despite the risk of revealing information about Earth. The short story ends with their final exchange when the heptapods suddenly disappear. Dr. Banks notes that her life has changed, and humanity’s advancement stagnates after their disappearance.

3.1 First Encounter with Heptapods

The first interaction of entities occurs right after Dr. Banks enters a tent, where the heptapods are residing behind a tall glass wall called “the looking glass.” During this interaction, the positions of a communicator and a receiver shift with each utterance, as it can be identified as a conversation apart from the other party, not understanding the language of the other. Dr. Banks initiates the interaction by walking up to the glass. This movement is mirrored by one heptapod. She then starts pointing at herself and Dr. Donnelly, her colleague, while saying “human,” and then points with a finger at the heptapods, asking who they are. Her first two attempts are unsuccessful. She repeats the action in hopes of invoking a reaction. This time, the heptapod closer to her points with its limb at itself and its companion and makes a fluttering sound.

In this encounter, there are two communicators and two receivers. Firstly, during the act of Dr. Banks pointing and talking, she acts as a communicator, as she wants to transfer a message. Although she is trying to explain that they are humans, the message itself consists of a single word to simplify the message to the maximum. Another message she communicates is asking them in her language who they are. Aside from using face-to-face interaction as a medium, pointing is used to add another way of expressing her statement and question. Dr. Banks takes a risk by pointing, because not every culture points with a finger. The receiver, a heptapod, does not react for a couple of times. It may be because it was processing the message. This message affects the heptapod by introducing it to a new concept, a human approach to communication. Gradually, the heptapod understands what is communicated and expected of it – to answer. The role of a communicator shifts in the middle of the interaction and the heptapod eventually responds to Dr. Banks by applying her gesture and speaking in its language, resulting in Dr. Banks discovering how the heptapods produce sounds: “[I] saw a puckered orifice at the top of its body vibrate,”⁴² she explains. Similar to Dr. Banks’s message, the heptapod is clarifying its kind, while exposing the physical body part used to produce sounds.

Dr. Banks returns to her computer in the room to review the visualisation of the sounds, in the form of spectrographs. By examining the sounds, she realises they are identical, naming them as “flutter1,” and she uses them to fill her initial question. She repeats the action of pointing and saying “human.” Instead of asking the question, she plays back “flutter1” while pointing at them. One heptapod responds with two fluttering sounds, one being marked on the computer as “flutter1” and the other being different. Therefore, she names the second flutter “flutter2.” The communication proceeds further with Dr. Banks pointing at an object on the heptapods’ side of the glass, supposedly their version of a chair, asking them what it is. The heptapod points at the chair and replies. Dr. Banks confirms its answer by repeating the pattern of talking and playing the recording back.

The heptapod replied; judging by the spectrograph, it looked like [flutter3flutter2]. Optimistic interpretation: the heptapod was confirming my utterances as correct, which implied compatibility between heptapod and human patterns of discourse. Pessimistic interpretation: it had a nagging cough.⁴³

⁴² Ted Chiang, “Story of Your Life,” in *Story of Your Life and Others* (New York: Tor, 2002), 119.

⁴³ Chiang, “Story of Your Life,” 119.

This excerpt shows the sound structure of a heptapod's answer and the thinking process of Dr. Banks. The heptapod answers to Dr. Banks's recording, and the repetition of "flutter2" indicates confirmation of Dr. Banks's statement, which was used similarly in a previous answer – "flutter2" following the initial sound. However, as it is stated, "flutter2" can hold no semantic nor syntactic meaning. By using the recording as a medium, the meaning of the message is conveyed faster. Moreover, when hearing its language, the heptapod processes the message faster in contrast to the previous message in human language and becomes more accustomed to pointing. Additionally, Dr. Banks suggests "the compatibility of patterns of discourse," which hints at the heptapods using similar means of communication as humans, which would explain their speed of learning human patterns.

After this exchange, Dr. Banks tries to pronounce "flutter1," while pointing at the heptapods. Both heptapods answer after a prolonged pause, but their answers lack either "flutter1" or "flutter2," and their replies differ from each other. Dr. Banks tries pronouncing it a couple more times, yet she receives either silence or unidentified sounds from the heptapods. Their first interaction ends with her playing "flutter1" and receiving a confirming "flutter2." To conclude the session, Dr. Banks asks them whether they have personal names, to which they reply positive. This information shows that the entities have another similarity with humans.

In this episode, Dr. Banks acts as a communicator, conveying a message that the heptapods are in fact heptapods, specifically "flutter1." With regard to human anatomy, her attempt to produce the "flutter1" fails, and the heptapods do not understand. The heptapods' reaction indicates a few possible interpretations. Firstly, the initial silence may indicate the time they take to process the content of the message. However, it is plausible they remain silent because they do not understand what is uttered. Secondly, the unidentified sounds lead to the assumption that the heptapods are saying they do not understand or that Dr. Banks succeeded in producing a flutter, but the meaning is different from "flutter1." Lastly, their response could suggest that the heptapods are discussing Dr. Banks.

3.2 Communication Media

Dr. Banks suggests researching their written form of language with new equipment. Until this moment, she was interacting with them as if they had no written form of language. Therefore, if the heptapods have a written language, the process of decoding their language would speed up drastically, as analysing the visual form is easier than applying the same

method to sounds. Their second session is similar to the first: Dr. Banks points at herself while saying “human” with the distinction that “human” is displayed on a computer screen.

Eventually, the heptapods understood what we wanted, and set up a flat circular screen mounted on a small pedestal. One heptapod spoke and then inserted a limb into a large socket in the pedestal; a doodle of script, vaguely cursive, popped onto the screen.⁴⁴

In this excerpt, after observing what the communicator, Dr. Banks, performs, the heptapods mirror her behaviour with their technology. The first sentence suggests that heptapods take some time to process Dr. Banks’s method. By showing humans’ way of displaying written language, Dr. Banks is encouraging them to do the same. The heptapods come up with an alternative to a computer screen. Their medium of communication is different from human technology, yet the human eye can see the words on the screen. Although the material of the screen is from the heptapods’ planet, its functions are identical to a monitor. In addition, the heptapod uses its limb, acting as a power source for the machine. The effect is the heptapods’ fast adaptation to the new communication medium. This moment is significant for Dr. Banks’s research, as she receives her desired answer along with an expanded insight into their technological advancement and their biological composition.

3.3 Sentence Structure

Dr. Banks knows that the heptapods have a written and spoken form of language. However, their interactions are carried out by translating only nouns, and the sentence structure of the language is still unknown. Therefore, the communication between them relies on pointing. This approach is ineffective because humans need to ask the heptapods about abstract topics. Therefore, the next logical step is to translate verbs, which would provide Dr. Banks with the structural rules. In this subchapter, the entities maintain the media used before: face-to-face interactions, computer screen and its equivalent.

Before long, the heptapods caught on to what we were trying to do; Raspberry began mimicking Gary, or at least performing the equivalent heptapod action, while Flapper worked their computer, displaying a written description and pronouncing it aloud.⁴⁵

During one session, Dr. Banks asks Dr. Donnelly to act out verbs, which are displayed on the screen. This excerpt describes the heptapods’ reaction. Dr. Banks, the communicator in this

⁴⁴ Chiang, “Story of Your Life,” 124.

⁴⁵ Chiang, “Story of Your Life,” 126.

scenario, pushes the heptapods to find an alternative to human actions by proceeding with the same method as before, with the addition of her colleague demonstrating the verbs. It is stated that the heptapod, the receiver, does not take long to understand and deliver a response. The general message of this exchange is identical to their first encounter: to translate this word into the heptapods' language. Given that the heptapods have learned the pattern of the sessions, their processing speed increases. Remarkably, the heptapods demonstrate verbs, which are the closest alternatives to English verbs. The generated effect is Dr. Banks's satisfaction with the heptapods' fast adaptations to her methods.

From this session, Dr. Banks formulates a theory about the heptapods' writing, signalling a shift in her change. She suggests that the heptapods think in a nonlinear framework. In addition, Dr. Banks calls their writing "a semasiographic writing system,"⁴⁶ which communicates meaning independently of spoken language, thus dividing their forms of a language. Language acquisition must be learned in two separate ways since the grammar from one form cannot be applied to the other and vice versa. Later on, Dr. Banks finds out one similarity in the heptapods' oral and written language, and that is the size. The bigger a "semagram," a character representing a whole statement, the longer the meaning of a statement. However, she expresses an issue with their writing. Reading the semagrams depends on the reader, who determines the order of reading individual parts of a semagram. All that is known about their writing is the final visualisation; thus, she conducts another experiment.

[I]nstead of displaying a semagram only after it was completed, they could show it to us while it was being written. They had agreed. [...] What Flapper had said was that the heptapods' planet had two moons [...] Comparing that initial stroke with the completed sentence, I realized that the stroke participated in several different clauses of the message. [...] That meant the heptapod had to know how the entire sentence would be laid out before it could write the very first stroke.⁴⁷

This exchange answers Dr. Banks's concerns about heptapods' writing. Flapper, the communicator, sends a message to Dr. Banks, the receiver, through writing. Although the content of the message is about the heptapods' planet, Dr. Banks can analyse the semagram in greater detail and understand the writing process. The effect produced is her realisation of the subjective process of their writing, while the heptapods do not demonstrate any effect.

⁴⁶ Chiang, "Story of Your Life," 130.

⁴⁷ Chiang, "Story of Your Life," 146.

I wrote out the semagrams for ‘process create-endpoint inclusive-we,’ meaning ‘let’s start.’ Raspberry replied in the affirmative, and the slide shows began. The second display screen that the heptapods had provided began presenting a series of images, composed of semagrams and equations, while one of our video screens did the same.⁴⁸

This episode concludes how entities communicate with one another at the end of the story. Dr. Banks, the communicator, initiates their session by writing a semagram. Her message is clear – to begin transferring their knowledge. Although the message, translated word by word into English, does not seem semantically correct, heptapod Raspberry, the receiver, understands and responds without delay. Both parties know the pattern in which the previous meetings were carried out. Therefore, it is easy for the entities to understand each other because they are familiar with the context. Additionally, communicating within one language proves to be the most efficient method.

3.4 The Heptapods’ Influence on Communication Effectiveness

The researchers gather enough vocabulary to proceed with science questions. The attempts to agree with the heptapods on physics are unsuccessful, until one tent introduces Fermat’s Principle of Least Time, which states that light always follows the fastest path. After this discovery, one question remains unanswered: “We regularly asked the heptapods why they had come. Each time, they answered ‘to see,’ or ‘to observe.’ [...] sometimes they preferred to watch us silently rather than answer our questions. Perhaps they were scientists, perhaps they were tourists,”⁴⁹ Dr. Banks states.

In this scene, Dr. Banks notes that during sessions focused on an area, the researchers would discreetly ask the heptapods their purpose of stay. Their answer is always the same: simple, yet non-specific. The researchers are communicators who anticipate an elaborate answer. Their message stays consistent: why are the heptapods on Earth? Although not explicitly stated, the media used likely remain the same. Referring to their answer “to see” and “to observe,” it serves as an effect of the researchers’ message. It is reasonable to assume that the heptapods refrain from revealing excess information. And although the heptapods answer almost all questions indisputably, it is unsettling for the researchers when they do not respond. When the heptapods stare silently, it creates a disconcerting effect, and the

⁴⁸ Chiang, “Story of Your Life,” 167.

⁴⁹ Chiang, “Story of Your Life,” 137.

communication stagnates. Humans are unable to continue, and the heptapods demonstrate the aftermath of not communicating with humans.

Despite the heptapods' silence, humans continue trying to figure out their origins, whereupon the heptapods say they are on Earth to observe. Eventually, both entities agree to hold meetings, where they exchange gifts. Dr. Banks herself participates in two out of eight exchanges.

I wrote out the semagrams for 'locus exchange-transaction converse inclusive-we' with the projective aspect modulation.

Raspberry wrote its reply. That was my cue to frown, and for Burghart to ask, 'What does it mean by that?' His delivery was perfect.

I wrote a request for clarification; Raspberry's reply was the same as before. Then I watched it glide out of the room. [...]

Colonel Weber stepped forward. 'What's going on? Where did it go?'

'It said that the heptapods are leaving now,' I said. 'Not just itself; all of them.'

'Call it back here now. Ask it what it means.'⁵⁰

This scene marks the last time the entities interact with each other. Dr. Banks and her colleague, Burghart, act as communicators who initiate the exchange. She sends the first message, which states the purpose of the meeting, to trade gifts. She operates with the same media as before, face-to-face interaction, while displaying semagrams on a screen. She notes that "[t]hat was [her] cue to frown," and "[h]is delivery was perfect," suggesting that both researchers already know about the heptapods' departure. However, their ability to see the future seems to Dr. Banks as if Burghart and she were actors. Heptapod Raspberry, the receiver, understands and answers correspondingly. She comprehends the response upon first reading, yet she asks for clarification. The researchers' reaction shows the effect of the heptapod's message. Both receivers of the heptapod's answer are confused by the sudden announcement. After the answer is repeated once again, the heptapod ends the conversation. A different effect is observed in Colonel Weber's reaction. It is implied that, as an indirect receiver, he experiences a wave of negative emotions upon hearing about the departure. He demands clarification, because he has clear objectives of attaining the heptapods' technology for the authorities.

⁵⁰ Chiang, "Story of Your Life," 169.

3.5 Change in Character

Dr. Banks, being one of the scientists interacting with the heptapods the most, her character begins to transform due to learning the heptapods' language. She contributes to the short story by symbolising the transformation of human nature when exposed to unknown concepts. Therefore, this subchapter focuses on the events implying her change.

The videoconferencing made for an incongruous working environment: our video screens were primitive compared to the heptapod's looking glasses, so that my colleagues seemed more remote than the aliens. The familiar far away, while the bizarre was close at hand.⁵¹

This excerpt takes place after the session about verbs. Dr. Banks presents her research progress at a meeting. This part of her thinking process demonstrates her subtle change. In contrast to her manner at the beginning of the story, where she is assigned the task, she approaches the issue from a human's point of view. However, her perception and opinions evolve. Her commentary points out the flaws of human technology by describing the feeling when using videoconferencing. The first sentence emphasises the gap between the human and the heptapods' technology. Although she is introduced to the looking glass a few days prior, she adapts to it and perceives its advantages.

Another example of her evolution is when she asks herself questions: "what kind of worldview did the heptapods have, that they would consider Fermat's Principle the simplest explanation of light refraction? What kind of perception made a minimum or maximum readily apparent to them?"⁵² By acknowledging differences between entities, she is determined to learn more. In addition, after recognising heptapods' writing patterns, she practises writing semagrams herself and eventually masters it. Dr. Banks further finds out that the heptapods possess "a simultaneous mode of awareness."⁵³ Their perception of the past, present and future bears no difference, and their actions correspond with their perception. With this information, Dr. Banks compares their mind to Fermat's Principle of Least Time. She explains that "[i]nstead of using language to inform, they used language to actualize."⁵⁴ As a result of learning heptapods' writing, she sees flashbacks of her past and glimpses of her and her daughter's future at the same time.

⁵¹ Chiang, "Story of Your Life," 128.

⁵² Chiang, "Story of Your Life," 144.

⁵³ Chiang, "Story of Your Life," 159.

⁵⁴ Chiang, "Story of Your Life," 164.

3.6 Transformative Effect

Considered as a whole, the communicators and receivers in “Story of Your Life” are Dr. Banks and the heptapods. Dr. Banks actively engages the conversation, while the heptapods share only the necessary information and remain more passive. Regarding the messages, Dr. Banks attempts to make a connection and seeks their knowledge. Through the medium of face-to-face interaction, the communication seems to suffice as the participants understand the messages. However, after introducing the recordings, computer screens and writing, the heptapods understand faster.

The central finding of Chapter 3.4 is that the heptapods demonstrate their power to influence the outcome of the interaction. Their silence and departure highlight the necessity of at least two participating parties for communication to occur. In addition, the silence at the beginning of the story signalled the processing time. At the end of the story, silence signals their unwillingness to answer questions, which invokes dissatisfaction in humans.

In conclusion, the overall effect of their communication is that the heptapods learn about human patterns of discourse, and Dr. Banks undergoes a major transformation. By understanding their language, she gradually attains their perception abilities, highlighting the importance of communication.

4 UNDERSTAND

Communication between entities is in “Understand” in the form of two humans, who have enhanced brain functions that allow them to use their physical and mental abilities to the maximum. The protagonist, Leon Greco, considers himself to be someone beyond human, and his goal is to achieve the highest level of intelligence possible within his limits. Whereas his peer, Reynolds, strives to help humans overcome global issues. Due to the clash of their interests, both agree there is no other option than to neutralise the other. Both undergo a newly developed treatment, “hormone K therapy.” Hormone K initiates the enhancement of brain functions. This transformation affects Leon’s communication with ordinary people, and his cognitive power extends beyond human borders.

This short story contains only two interactions between Leon and Reynolds. The first one takes place at a grocery store, where Reynolds subtly exposes his identity to Leon through a somatic signature, and the second one occurs at Reynolds’s apartment three days later. Despite the small number of interactions, Leon and Reynolds share an immense amount of information, ending with Leon’s downfall.

In the beginning, Leon communicates with his doctors ordinarily, but as his intellect grows, he perceives human speech as slow with a limited vocabulary, making conversations fruitless. In addition, he learns years of education in a few weeks and starts a project of creating a new language. This language would satisfy his need for a medium by which he would be able to express his thoughts. Furthermore, he learns to control functions in other parts of his body. With this capability, he smells and releases pheromones, which provoke reactions in people. Leon plans to use pheromones on presidents to support his ideologies, shifting direct communication to manipulation. Ultimately, he stops speaking and manipulates his surroundings through unnoticeable gestures, proclaiming himself as hyper-intelligent and better than humans – a superhuman.

His plan changes when he receives an indirect message through stocks, in which he has invested. Through investment patterns, Leon finds out about the addresser, Reynolds, an individual who also received hormone K therapy. Through several databases, Leon uncovers Reynold’s interests, which do not correlate with Leon’s. Due to the clash of interests, the two meet at Reynold’s apartment.

4.1 Superhuman and Human

At the beginning of the short story, Leon and his doctors notice his brain activities are changing. His gradual transformation is observed in his expressions when he talks with the doctors. After he wakes up from an incident, he comments on his state: “My heart’s going like a jackhammer. Christ.”⁵⁵ His expression seems human, and the last word indicates his emotional state. Eventually, he realises his current location and undergoes various tests with doctors.

‘Well, Leon, you did... very well. On both tests you scored in the ninety-ninth percentile.’

My jaw drops. ‘You’re kidding.’

‘No, I’m not.’ He has trouble believing it himself. ‘Now that number doesn’t indicate how many questions you got right; it means that relative to the general population –’

‘I know what it means,’ I say absently.⁵⁶

In this exchange, Leon takes on the role of a receiver. His assigned doctor, a communicator, reveals Leon’s performance in the tests. The doctor’s message is clear, as it contains expected information: percentages obtained from the tests. However, a pause in the doctor’s first sentence suggests disbelief. The effect resulting from the doctor’s message is a shock. Leon understands the message, but he questions his abilities. The medium used is face-to-face interaction, thus, his reaction is both physical and verbal, the former being astonishment and the latter an addition to his grimace. The doctor continues by explaining how the results are classified. His answer indicates that, as a receiver of Leon’s answer, he does not understand the message as an emotional response but as literal. Leon interrupts him before he finishes his explanation, ensuring their time is not wasted, while explaining he understood the first time. The note “I say absently” signifies the effect the whole meeting leaves on Leon. His answer implies that he needs more time to process.

Leon’s expressions remain constant until he notices major changes in his perspective. As he processes new information faster and clearly, his ability to feel emotions does the opposite. At the same time, the doctors notice the hormone’s side effects and are intrigued to examine him further. Leon understands their ulterior motives and decides to remove himself from the situation before the doctors and the government’s officials exploit his intellect.

⁵⁵ Ted Chiang, “Understand,” in *Story of Your Life and Others* (New York: Tor, 2002), 37.

⁵⁶ Chiang, “Understand,” 40.

‘You want to withdraw from the study?’

‘Yes, effective immediately. I’m returning to work.’

‘If it’s a matter of compensation, I’m sure we can—’

‘No, money’s not the problem. I’ve simply had enough of these tests.’⁵⁷

This excerpt describes the moment Leon calls doctor Shea to cancel future sessions regarding examinations on hormone K. The exchange starts with Shea, a receiver, clarifying the news. The medium of communication is a telephone call, which ensures that the conversation is quick and less personal than a face-to-face meeting. Leon, a communicator, confirms his needs. Although Shea understands his message, he remains persistent. Given that Leon mentions work, Shea tries to lure him with money. Due to Shea’s persistence, the communicator sees that the receiver failed to understand his message, therefore, Leon provides the real reason for stopping the meetings. Compared to the previous excerpt, Leon’s speech is less conversational. His words are thoroughly structured and mechanical, resembling a robot.

Shea attempts to convince Leon one more time, but he refuses his offer. Sensing Shea’s motives, Leon withholds his knowledge, marking the beginning of his isolation from humans. Nonetheless, two days later, doctor Shea contacts Leon again to convince him to come to the hospital, due to an unexpected side effect. It is assumed that Shea is dissatisfied with Leon’s sudden change of mind, hence reinforcing his persuasion.

‘Leon, you have to come in for an examination. I’ve just been informed: adverse side effects have been found [...]’

‘I’ll come down right away.’

‘Good.’ Shea is relieved that his delivery was convincing. ‘We can examine you as soon as you arrive.’⁵⁸

This passage presents a second call between Leon and Shea. The medium for communication remains the same as in the previous excerpt. Shea, a communicator, initiates the call with an order. To soften the tone of the message, he mentions a made-up story about another patient who is experiencing side effects. Leon understands the purpose of the message and agrees to come to the hospital. His answer satisfies Shea, to which Shea’s response maintains coherence with the fabricated story. The effect the message leaves on Leon is negative, as he is aware that Shea is attempting to manipulate him. On the contrary, Leon’s response

⁵⁷ Chiang, “Understand,” 50-1.

⁵⁸ Chiang, “Understand,” 51.

creates a false impression on Shea, who, after hearing a desired answer, awaits Leon's return. However, Leon does not go to the hospital. The last conversation between Leon and Shea convinces him that he no longer seeks interactions with humans, and he abandons his hometown. Leon takes another dose of hormone K, which helps him create a part of the new language, but he eventually fails, as he acknowledges the limitations of mortality and time.

4.2 Protagonist's Realisation

Enthusiastic about the hormone K, Leon cannot stop thinking about other patients who might have undergone the same treatment. He searches the hospital's database, but he fails to obtain any information or connections to other patients. However, because Leon invests in stock under fake names, he receives a message from his peer saying, "Greco." Leon questions the individual's motives for contacting him, whether he is an ally or an enemy. After a thorough investigation, Leon finds out his name and address, and he states that Reynolds is waiting for him at his apartment in Philadelphia. Leon arrives at the apartment, and he meets Reynolds. Both parties are aware beforehand that their values differ.

<A pleasure to meet you.> [says Reynolds.]
 [...] <A shame it must be as enemies.>
 [...] <Indeed. Imagine how we could change the world, acting in concert. Two enhanced minds; such an opportunity missed.>
 True, acting cooperatively would produce achievements far outstripping any we might attain individually.⁵⁹

This excerpt marks the start of their first face-to-face meeting. Reynolds assumes the role of a communicator by initiating the conversation and encouraging Leon's input in a friendly way. It is written that for communication, both participants are "exchanging fragments from the somatic language of the normals: [...] Each phrase takes a tenth of a second."⁶⁰ Participants use these fragments as a medium. Owing to the limitations of regular English, they use a shortened version, which they understand without explaining its rules before this interaction. Reynolds's first message is clear, and Leon, the receiver, reciprocates his greeting by expressing honest thoughts on their contrasting interests. Both men understand their position regarding the context, therefore, they have no issue comprehending all messages. Upon hearing Leon's remark, Reynolds sends his second message, which contains

⁵⁹ Chiang, "Understand," 76.

⁶⁰ Chiang, "Understand," 76.

a response to Leon's previous reaction. He finds their misaligned values unfortunate and explains the potential future if the two cooperated. The effect created is that Leon does not respond, yet he agrees with Reynolds. Instead, the last line represents Leon's thoughts. It suggests that he does not want to show Reynolds friendliness or any sign of weakness, as they must overpower one another.

Reynolds says, quickly and quietly, five words. [...] Together they encapsulate a revolutionary insight into sociology; using somatic language he indicates that it was among the first he ever achieved. I came to a similar realization, but formulated it differently. I immediately counter with seven words, four that summarize the distinctions between my insight and his, and three that describe a non-obvious result of the distinctions. He responds.⁶¹

Their meeting continues with a short episode, which contains both parties exchanging all information gathered throughout the past few months on hormone K. This excerpt describes the intense exchange of knowledge. Their medium remains the same as in the previous excerpt. Reynolds, the communicator, commences the transmission with a short message, containing his view on sociology. Leon, the receiver, comprehends the meaning of the five words uttered. At the same time, as his brain activity is heightened, he concludes that Reynolds's interpretation differs from his. The effect that arises from Reynolds's message is Leon's response, in which he discloses the differences in their perceptions. This moment highlights the speed and clarity of their communication, which contains no errors.

Leon and Reynolds exchange information for a couple of minutes. As the discussion progresses, they simultaneously take on the role of a communicator and a receiver, as their messages overlap without causing disruption. Both participants understand received messages and can respond effectively without a pause. Their fast exchange stagnates when Reynolds mentions his plan to aid humanity in global issues.

<Why assume such a risk for the sake of the normals?>

<Your indifference toward the normals would be justified if you were enlightened; your realm wouldn't intersect theirs. But as long as you and I can still comprehend their affairs, we can't ignore them.>

<What about the beauty visible from enlightenment? Doesn't it attract you?>

This excerpt elaborates on Reynolds's reasoning for his goal. Leon, a communicator, sends a message in the form of a question, scrutinising Reynolds's motives. The message carries a

⁶¹ Chiang, "Understand," 77-8.

hidden meaning: he subtly disapproves of Reynolds's decision and cannot grasp it, given that there is no personal benefit from helping humans. Reynolds, a receiver, understands Leon's point of view without being offended and responds accordingly. He politely criticises Leon's perception with a logical argument. His reply suggests that the negative implication of Leon's question is almost undetected. On the contrary, the receiver's reply leaves a notable effect on the communicator. Instead of reacting to the reply directly, Leon asks two additional questions, ignoring the argument. His questions shift the topic of the discussion and Reynolds's attention. The meaning of his second message is to tactically convince Reynolds to align with his perception, eliminating the need for a conflict. Despite his efforts, Leon is subconsciously aware that he is unlikely to succeed. Leon acts more emotionally during this interaction, which suggests that either he is trying to manipulate Reynolds or that part of humanity remains inside him.

This exchange marks the point where Leon begins his attack on Reynolds. The conflict starts as Leon raises his opponent's blood pressure, which is immediately countered. They engage in a mental clash, raising each other's blood pressure and influencing brain activity, all within a silence in the real physical world. After unsuccessful attempts, they learn to repair the damage inflicted on their psyche, and the clash continues.

I project the equivalent of a smile.

Reynolds smiles back. <Have you ever considered --> Suddenly he projects only silence. He is about to speak, but I can't predict what. Then it comes, as a whisper: '-- self-destruct commands, Greco?'

Meanwhile I give my response lightly, casually. <Hit me with your best shot.>⁶²

This scene takes place after Leon and Reynolds end their attacks on each other's brains. Leon receives an important message. He initiates this interaction with a simple grimace, which is immediately reciprocated. Reynolds assumes the position of a communicator. The medium of communication used remains the somatic language, with the addition of smiles. In his message, he asks whether Leon knows about a phenomenon of self-destructive commands. His choice to pronounce the last part of the question creates a lasting effect on Leon. Although his message contains only the question, Leon understands its hidden meaning: Reynolds possesses the ability to destroy Leon's mind, and he is threatening him. Before Leon, a receiver, answers, it is stated that he takes every measure to shield himself from a "word" which could trigger his mind's deterioration. With his precautions being done,

⁶² Chiang, "Understand," 80-1.

Leon is prepared to respond to Reynolds's subtle provocation. His actions demonstrate the panic that overpowers Leon upon receiving the threat. His answer is conversational and rather informal, compared to his previous answers. His response implies that he is confident in his safety preparation.

Internally, Leon experiences panic and desperately attempts to create countermeasures for Reynolds's incoming attack. He blocks every possible route to save himself, as he is at a disadvantage. Meanwhile, Reynolds remains composed, and upon Leon's question, he reveals that he has tested this theory on humans, leaving Leon feeling more uncomfortable.

With his finger upraised, he says, 'Understand.'

At first I don't. And then, horrifyingly, I do.

I comprehend the Word, and the means by which it operates, and so I dissolve.⁶³

This exchange marks the end of their conversation and the end of Leon. Reynolds, remaining the communicator, speaks one word accompanied by a gesture to signal attention, which sets off the destruction. Leon, who as a receiver hears the message, states that he does not comprehend it, yet after a while, he does. It is pointed out in the short story that Leon sees flashbacks of all the correlating events regarding Reynolds, which paint the whole picture of Reynolds's strategy. Leon understands that every minor detail Reynolds unnoticeably planted in front of him is part of his elaborate plot to eliminate Leon. These details allowed the word to penetrate Leon's defences. The effect caused by the word is evident in the last line, where Leon thinks to himself, "and so I dissolve," suggesting that he has become mad, or that his brain functions stop entirely, ending the short story at an open ending.

4.3 Destructive Effect

In summary, Chapter 4.1 features human communicators and receivers. The messages conveyed in the chapter differ. The first is a simple message about Leon's test results, while the second and third involve a negotiation concerning Leon's withdrawal. The media used in Chapter 4.1 are face-to-face interaction and phone calls. They influence the outcome of the interactions. While a face-to-face interaction allows Leon to communicate through facial expression, the phone call enables both participants to discreetly manipulate each other. An effect produced at the end of Chapter 4.1 is Leon's negative approach to doctors.

⁶³ Chiang, "Understand," 83-4.

In contrast to Chapter 4.1, Chapter 4.2 focuses on communication between superhumans. Similarly, the messages sent are feelings of regret, the exchange of knowledge and a subsequent threat, the pointing motion and the uttered word. The media used partly differs from that of Chapter 4.1. Although the participants use face-to-face interaction, namely smiles and occasional speech, they use somatic fragments to speed up their communication process. Part of the effect is comparable to that in Chapter 4.1, as Leon feels negative emotions. However, the overall effect of the communication is more intense. Compared to “Story of Your Life” and Chapter 4.1, the effect of Reynolds’s word “understand” triggers Leon’s loss.

5 THE LIFECYCLE OF SOFTWARE OBJECTS

A central theme that “The Lifecycle of Software Objects” depicts is the development of virtual creatures. Through the character of Ana Alvarado, Ted Chiang explores communication between humans and their invention, “digital organisms that live in environments like Data Earth,”⁶⁴ called “digients.” Ana, a former zookeeper, is hired by “Blue Gamma,” a company where her friend, Robyn, works. Her main task is to develop and train digients, specifically “mascots,”⁶⁵ for the company’s project “Neuroblast.” They are virtual pets that cognitively develop depending on their environment. During the early stages of their development, trainers communicate with them as if they are something in between children and animals. Unlike the usual software, digients are programmed to learn a language, recognise social norms, and respond to trainers through experience. Therefore, Ana spends the majority of her working hours raising them.

Digients are officially released to the public. A significant change occurs when people do not see immediate development in the digients’ behaviour and their maintenance is financially expensive. Companies are forced to abandon the digient idea, and Ana’s company goes bankrupt. Ana and her coworker, Derek Brooks, decide to keep their mascots and continue raising them. Their former customers opt to do the same, but as time goes on, their numbers decrease. Furthermore, the remaining digients from Neuroblast evolve into self-aware entities with feelings, but they are unable to interact with people due to technological advancements.

5.1 The Digients’ Character

The first time Ana sees digients is before she is hired. Robyn explains the digients’ purpose while talking with one. The digients slightly resemble animals, their size does not exceed the size of a real pet. In addition, they learn through positive reinforcement, receiving head scratches and food pellets as a reward.

Robyn’s avatar walks over to the chimp rolling the ball and crouches down in front of it. “Hi Pongo.

Whatcha doing?”

“Pongo pliy bill,” says the digient, startling Ana.

“Playing with the ball? That’s great. Can I play too?”

⁶⁴ Chiang, “The Lifecycle of Software Objects,” in *Exhalation: Stories* (New York: Alfred A. Knopf, 2019), 64.

⁶⁵ Chiang, “The Lifecycle of Software Objects,” 72.

“No. Pongo bill.”

“Please?”⁶⁶

This excerpt depicts Ana’s first encounter with digients. Pongo, the digient, takes on the role of a communicator, stating that he is playing with a ball. However, the message itself is ungrammatical as “play and ball” is replaced by “ply and bill.” Given that Robyn, the receiver, is teaching Pongo English, she understands him despite his incoherent utterances. The medium of communication is the virtual world, where the digients live. The virtual reality mimics real-life interaction except for a missing sense of smell. Additionally, Pongo is speaking English at the level of a child. The effect the message has on Robyn is neutral. She clarifies what Pongo said and asks to participate in the activity. A different effect is visible on Ana, an indirect receiver, who is startled because the digient can talk.

After this meeting, Ana is hired and she interacts with the digients alongside her colleagues Robyn and Derek. The company releases a beta version of the digients, which is met with positive feedback. However, Ana believes customers treat digients as animals, which she states is false. The company wants to provide customers with a physical version, a small robot. The first digient to test out a robot is Jax, Ana’s mascot.

Meanwhile Ana calls over Jax, whose avatar is a neo-Victorian robot made of polished copper. [...]

“See the blocks, Jax? What shape is the blue one?”

“Triangle,” says Jax.

“Good. What shape is the red one?”

“Squir.” [...]

“Good job, Jax.” Ana gives him a food pellet, which he devours with enthusiasm.

“Jax smirt,” says Jax.⁶⁷

This exchange captures the nature of digients. In this interaction, both entities use speech and the virtual world as media of communication. Ana, the communicator, asks Jax, the receiver, simple questions about blocks. The question does not contain a message, but it is a command. A produced effect is in the form of Jax’s polite responses. For that reason, making Jax a communicator upon uttering the answers. All Jax’s answers contain the same message, a visual quality of the subjects of the questions. As previously with Pongo, Jax talks in English, but his pronunciation of the word “square” is distorted. Ana, being the receiver,

⁶⁶ Chiang, “The Lifecycle of Software Objects,” 64-5.

⁶⁷ Chiang, “The Lifecycle of Software Objects,” 71.

understands his message even with the mispronunciation. She rewards Jax, depicting the effect of Jax's answers. This suggests that Ana is satisfied with the progress of the digient.

Upon rewarding Jax, Ana says, "Good job, Jax." This marks another shift in roles. Ana is the communicator, transferring words of affirmation, to meet the requirements for their development, and for personal reasons, as Ana feels close to the digient. Jax understands her affirmation, notably since he recognises the pattern of receiving rewards for the right behaviour. An effect produced is Jax's happiness. In addition, his reaction "Jax smirt," highlights the child-like nature of the digient.

5.2 Advantages of Virtual Reality

One feature, previously mentioned, is the extension of the product range of Blue Gamma. They receive a testing model from "SaruMech Toys," a company renting robots to customers. Jax's reaction to the new robot is full of emotions: "Wow [,]" and "Wow wow. Sound different. Wow wow wow." To which Ana responds: "It's okay, Jax, [...] Remember, I told you your voice might sound different in the outside world."⁶⁸

In this scene, Jax, the communicator, expresses his amazement and excitement by uttering "wow." Additionally, his other message contains information about the sounds. This interaction signifies a difference in the medium used, which is the robot. Speech, as the other medium, remains. Ana, the receiver, understands the intended meaning, as her response unveils their previous conversation about the sounds. Her first reaction is to calm Jax down, because the effect he leaves on her is feelings of uncertainty about what Jax might do in this enthusiastic state.

"Hi Jax," she says. "It's me, Ana."

"You wear different avatar," Jax says.

"In the outside world, we call it a 'body,' not an 'avatar.' And people don't switch their bodies here; we can only do that in Data Earth. Here we always wear the same body."

Jax pauses to consider that. "You look this always?"⁶⁹

This excerpt takes place right after Jax stabilises. Firstly, Ana introduces herself, acting as a communicator. Her message is straightforward because she knows Jax is familiar with the context. Jax, the receiver, does not reciprocate the greeting, but instead sends a message regarding her real physical features. Thus, shifting the roles of a communicator and a

⁶⁸ Chiang, "The Lifecycle of Software Objects," 81.

⁶⁹ Chiang, "The Lifecycle of Software Objects," 81.

receiver. He likely understands the message, but being used to a different Ana's avatar causes him to experience confusion. Additionally, his manner of speech seems more grammatical, because there are no speech errors, which suggests that Jax can use English abundantly with minor errors. Here, the omission of an article is evident.

From the third sentence, Ana takes on the role of a communicator again. Her message is an explanation about her appearance. Given that Ana and Jax held this conversation prior to this event, it can be assumed that Ana is repeating the explanation to remind. It is stated that Jax, the receiver, takes time to process the message. By hearing the message during an interaction in an unfamiliar environment, he takes time to understand the message, and the whole context, hence the physical world. An effect caused is Jax asking Ana whether this is her default visage. The question is posed neutrally, as it appears that Jax is confirming that he understands the message. This interaction signals Jax's calmness and his urge to learn more about the real world.

The customers rent out the robots to send their digients out to explore the world. The area which they are allowed to explore is controlled by SaruMech. In one instance, one of the mascots, Marco, demands to visit a SaruMech's field trip park instead of an office park, where Ana and Marco currently are. Ana cannot teleport to the destination, thus, she explains the situation to Marco.

"It doesn't matter how hard I try, Marco; the outside world doesn't have portals. Only Data Earth has portals."

"Then we go Data Earth, open portal there."

"That would work for you if there's a body there for you to wear, but I can't wear a different body, I'd have to move this one, and that would take a long time."

Marco thinks about that, [...] the digient's face actually suggests his incredulity.

"Outside world dumb," the digient announces.⁷⁰

At the beginning of this scene, Ana serves as a communicator, explaining the reasons why the location of their session cannot be changed. The message is structured with an empathetic approach aimed directly at Marco. The second part contains the principles of the real world to provide him with context. Marco, the receiver, partially understands the intended meaning of the message. Nonetheless, given the digient is raised in a different reality, it does not fully grasp the fundamentals of a physical world – travelling. Marco suggests that they travel through the virtual reality. His response is an effect of the communication, which transfers

⁷⁰ Chiang, "The Lifecycle of Software Objects," 86.

the communicator role onto Marco. In addition, his response points to the fact that digients create original ideas and solutions within a limited context.

After hearing his response, Ana, the receiver, understands Marco's suggestion. Taking on the role of a communicator, she acknowledges his limited knowledge and responds by clarifying why his plan cannot be executed. Her message conveys an explanation about travelling without extra details about its biological structure, to maintain simplicity. Marco assumes the role of a receiver, and it is noted that he "thinks about that." This moment highlights the digient's freedom to think for himself. Furthermore, the effect the message provokes is Marco's facial expression, which is observed for the first time, and the eventual conclusion that the reality "outside" the virtual world is devoid of the advantages of digital presence.

5.3 Entities' Emotions

In the short story, the digients are designed to be submissive, however, competition between the digients themselves is inevitable as they seek human recognition. In cases where the digient acts out of the desired model, its genome is eliminated. An instance occurs when Robyn's digient, Lolly, swears during a group activity. The activity includes the digients rolling down a hill for the first time. Lolly hits a bridge at the bottom and says "[f]uck."⁷¹ The single word startles all humans nearby. Ana's supervisor is present and demands they reboot the digients three days back to delete any memory of the word, due to which the activity is deleted as well.

As the digients are released to the public, people take care of the digients with utmost care, and they create forums for digient's owners to contribute their experiences and advice. One of the members of the forum, where Ana and Derek are members of, writes about their observation: "We were at the playground, and another digient hurt himself when he fell and was crying. Natasha gave him a hug [...], and I praised her to high heaven. Next thing I know, she pushes over another digient to make him cry, hugs him, and looks to me for praise!"⁷² This post shows how the digient changes depending on the positive feedback. The media used are virtual reality and speech. The member is a communicator who positively reinforces the digient's uprightness. Although the message is not explicitly stated, it is presumed that its connotation is positive. Natasha, a receiver, comprehends the message

⁷¹ Chiang, "The Lifecycle of Software Objects," 73.

⁷² Chiang, "The Lifecycle of Software Objects," 76.

differently, creating a cognitive gap between the digient and its owner. Provided that the reaction of the digient, the effect, is to push another digient to mimic the first occurrence to receive another praise, the member's digient lacks context and morality. As a result, an unintentional miscommunication happens, due to the digient's state of reasoning ability.

In one instance, when Blue Gamma is no longer in business, Ana encounters another problem with the digients' learning process. They have a habit of watching television to learn about the real world. Someone hacks into Data Earth's system to show the digients' inappropriate content on the television, containing a blowjob, which Jax and Marco later try to recreate. Simultaneously, Ana sees an inappropriate image on the television and turns it off immediately. It is explained that the digients' have "mirror neurons[, which help] them learn and socialize, but also means they're distressed by what they [see] on the television."⁷³ Because of this, Ana is worried about the digients' fate, especially Jax's.

"- turn off television?" He stops, realizing his surroundings have changed. "What happen?"

"It's okay, Jax."

He sees the body he's wearing. "I in outside world." He looks at her. "You suspend me?"

"Yes, I'm sorry. I know I said I wouldn't, but I had to." Plaintively, he asks, "Why?"

Ana's embarrassed by how hard she's hugging the robot body. "I'm trying to keep you safe."⁷⁴

This scene occurs after Ana pauses – suspends – Jax to shield him from explicit content. Jax finishes his previous sentence, as the pause does not influence Jax's reality. In the first line, Jax, a communicator, asks two questions, disregarding the first incomplete question. The message of the first question is literal, as to what is happening. On the other hand, the second question contains two messages. Firstly, given Ana promised Jax she would never suspend him, Jax investigates her actions. Secondly, the message reveals an underlying implication about Jax's emotions. By stopping, he orients himself, and feelings of uncertainty and broken trust cause the incoming questions. The medium used is a robot body and speech. This factor causes the interaction to be more intense, considering that Ana can see Jax in the real world.

Within this context, Ana fulfils the role of a receiver. She knows the consequences of her actions prior to suspension, thus understanding his messages. The effects are evident in Ana's responses. Her first response is to ease Jax's unsettled state. Her second response is an apology, followed by a justification. The interaction continues with Jax proceeding to ask for clarification on Ana's intentions. As stated, the effect his question produces is Ana

⁷³ Chiang, "The Lifecycle of Software Objects," 102.

⁷⁴ Chiang, "The Lifecycle of Software Objects," 104.

hugging him. Moreover, Ana continues to justify herself. Her actions suggest her deep emotional connection to Jax. This moment is significant, as it marks the beginning of Ana's realisation about her deep emotional involvement with the digients.

5.4 Digients' Purpose

The success of digients as a species designed for human consumption is constantly questioned throughout the short story. The majority of digients' owners lose interest since the commitment to raising them is not justified. Ana and Derek keep the last forum of Blue Gamma's digients active. However, over time, the number of members decreases, and the number of digients as well. Few of the oldest digients like Jax are experiencing feelings of loneliness, as their peers gradually disappear.

The crisis worsens as a new platform, "Real Space," arises. Data Earth is no longer up to date. Additionally, mascots face a difficult time, because they are programmed in a way which prohibits digients' owners from upgrading them to be compatible with Real Space. Whereas other companies with newer digients can upgrade them with the help of a new genomic engine "Sophonce." New digients are no longer used for entertainment, but as practical software, which is developed without the need for human interaction. For example, digients called "Drayta" are designed to solve puzzles, and they possess "an engine that favors asocial behavior and obsessive personalities."⁷⁵ One of the digients with Sophonce engine, "Voyle," is signed by its owner as a corporation, thus gaining the title of a legal person. Marco and Polo, Derek's digients find out about this fact. Both digients feel the need to acquire the same privilege.

"People say being corporation great," says Marco. "Can do whatever want."

[...] "Well, you're not incorporated, and you definitely cannot do anything you want."

"We sorry," says Marco, suddenly appreciating the trouble he's in. "Just want be corporations."

"I told you before: you're not old enough."

"We older Voyle," says Polo.

"Me especially," says Marco.

"Voyle's not old enough for it, either. His owner made a mistake."

This interaction occurs after Marco and Polo anger a person online to ensure that the individual contacts Derek, drawing his attention to the digients, who are trying to justify it by implying the significance of Voyle's rights. The two digients, communicators in this

⁷⁵ Chiang, "The Lifecycle of Software Objects," 119-20.

exchange, are explaining their behaviour to Derek, the receiver. Their first message conveys the advantages of being a corporation, however, their argument is negated by Derek right upon hearing their reasoning. Due to the limited perspective of the digients, their assumption is distorted, and they understand it as a gateway to freedom. Digients are in their customised robots, the medium used. This medium strengthens the intimacy of the conversation.

After Derek receives the first message, he takes on the role of a communicator to send back a message, which states the limitations of being a corporation. With his assertive answer, Derek remains the communicator for the rest of this excerpt. He lists reasons why he forbids the digients' change. Similarly to Ana with Jax, Derek simplifies the answer to avoid possible misunderstandings. Both digients understand an unspoken meaning of Derek's message: they are not allowed to be a corporation. An effect caused by Derek's response is that the digients apologise and tell him an irrelevant argument concerning their age. They believe their argument is valid, however, their saddened tone implies they accepted Derek's choice, as they view him as an authority and a parental figure.

Since Neuroblast digients cannot enter Real Space, Ana copies its worlds to keep Jax occupied. Nevertheless, Jax experiences loneliness more often as he understands that the world is a mere copy, and his friends are disappearing at a rapid rate. Ana and Derek try to raise money for "porting" the Neuroblast genome, but they encounter a dead end. Remaining Neuroblast members consider suspending their digients until enough money is raised. Regarding this thought, Derek disagrees with it, as he knows any suspended digient stays suspended. The digients themselves notice the uneasiness of their owners, especially Jax, who confronts Ana about it.

"Sometimes wish I just be suspended, not have to wait more. Restarted when I can enter Real Space, feel like no time passed."

The comment catches Ana off-guard. None of the digients have access to the user-group forums, so Jax must have come up with the idea on his own. "Do you really want that?" she asks.

"Not really. Want to stay awake, know what happening. But sometimes get frustrated." Then, he asks, "You sometimes wish you don't have take care me?"

She makes sure Jax is looking her in the face before she replies. "My life might be simpler if I didn't have you to take care of, but it wouldn't be as happy. I love you, Jax."

"Love you too."⁷⁶

⁷⁶ Chiang, "The Lifecycle of Software Objects," 137.

In this engagement, Jax, a communicator, initiates the conversation with Ana, the receiver. He shares his changed views on suspending. The medium remains a virtual world. In the first two sentences, Jax's message conveys the possibility of him not experiencing the negative feelings if suspended. Since he does not address Ana, his message suggests that he speaks his thoughts aloud without a conscious decision to share them. How Jax delivers his message indicates his transformation. Preceding this instance, he resisted the suspension, as he wanted to experience everything. However, due to his current helplessness and frustrations, he believes the best course of action is to abandon his beliefs and to accept suspension. As noted in the excerpt, Ana is shocked at his re-evaluation, signalling the effect. Her emotion is apparent in her response, where she verifies what she understood.

The second time Jax speaks, he answers Ana's question. At first, he indirectly assures Ana that his opinion on suspension remains unchanged, yet he proceeds to elaborate on his reason for changing his mind. He concludes his turn in the conversation by asking Ana a provocative question, which is intended to reveal Ana's emotions about the situation. Ana immediately realises its intent, and compared to her previous reaction, she keeps her composure and rationally thinks about her response. She shifts her role to a communicator as she replies to Jax. She ensures that Jax receives her message without interruptive factors, specifically visual ones. Ana realistically explains the probable scenario if Jax were absent. Nevertheless, she adds that the emotional value is immeasurable compared to her present situation. She ends her reply with a confession to Jax. Altogether, she purposefully ignores the negative connotation of his question, whilst providing an honest answer. Jax, as the receiver, reciprocates her feelings. His reply proposes that Jax's emotions are stable, and the tension of the conversation is lifted.

Towards the end of the short story, a corporation called "Binary Desire" contacts Ana and Derek about their idea of sustaining the digients. They plan to use digients as virtual sex partners for humans. Neuroblast owners are puzzled, because they view digients as their children, thus they contemplate their moral values. Binary Desire representatives explain that the digients will be trained, and their partner will be customised to an individual digient and a human. In addition, as it is stated by Binary Desire: "We don't condone any non-consensual sex acts, and that includes sex with digients."⁷⁷ The group of all Neuroblast

⁷⁷ Chiang, "The Lifecycle of Software Objects," 147.

digients' members agree to sign contracts with Binary Desire individually, thus breaking the group's strong connection to one another.

Derek shares this idea with Marco and Polo. They suggest he sign the contract. After moments of thinking, Derek agrees to allow Marco to become a product for humans' sexual desires, primarily for his reasons regarding Ana and her potential job offering, which demands that she undergo neurochemical manipulation.

Then he calls Marco and Polo over in their robot bodies.

"Ready sign contract?" asks Marco.

"You know you shouldn't do this if it's just to help the others," says Derek. "You should do it because it's what you want to do." Then he wonders if that's really true.

"You not need keep asking me," says Marco. "I feel same as before, want do this."⁷⁸

In this dialogue, Marco and Derek are close to signing a contract with Binary Desire. Marco, a communicator, begins with a straightforward question targeted at Derek, the receiver. Since both sides are familiar with the context of the activity, no further explanation is needed. The medium featured is a robot. Derek understands the message, yet his answer does not directly respond to Marco's inquiry. Derek's response signifies his need for reassurance concerning Marco and an indirect attempt to discourage him from proceeding with his decision. Overall, his message contains advice, which, as is noted right after his response, hints at the fact that Derek feels exposed by his advice, as he reacts based on helping Ana. Marco reacts to Derek by setting boundaries regarding this topic and simultaneously reassures Derek with a determined statement with regard to his wants. The overall effect of this interaction is Derek's uneasiness about his decision. This decision guarantees that Binary Desire sponsors Neuroblast porting. Ana is at a loss, as she expected Derek not to sign the contract, yet she experiences relief and hope, because she imagines the future with Jax and all the possibilities regarding his development.

5.5 Emotional Effect

A comprehensive view of "The Lifecycle of Software Objects" reveals that the communicators and receivers are humans and digients. Concerning the messages, Chapter 5.1 contains simple messages, while Chapter 5.2 emphasises different aspects of virtual and real world from the digients' perspective. In addition, Chapter 5.3 examines messages about

⁷⁸ Chiang, "The Lifecycle of Software Objects," 168.

the participants' emotions and misunderstandings, while Chapter 5.4 features digients sharing their opinions and the subsequent resolution of the digients' purpose crisis.

The media used throughout the short story are a virtual world and robots in the real world, accompanied by speech. The virtual world ensures that people from various parts of the world can interact with one another and with their digients. Furthermore, the use of robots primarily affects Ana, as they make her more emotional. The speech likewise plays a crucial role, as the digients develop with interactions.

Lastly, the effects produced in each chapter differ. In Chapter 5.1, interactions evoke feelings of satisfaction and happiness. However, beginning with Chapter 5.2 and continuing through Chapter 5.4, the conversations evoke mixed emotions – namely the digients' dissatisfaction with the real world, Ana's realisation about her deep emotional involvement, and Derek's ultimate decision to save Ana.

CONCLUSION

This thesis has explored different forms of communication in selected science fiction short stories written by Ted Chiang. Lasswell's model of communication has helped this thesis to maintain a simple yet orderly structure in its analyses. According to the analyses, these short stories share common themes: interactions between entities, specifically humans and others, and the influence of new technology.

Regarding the participants in the communication (communicators and receivers), they are among the entities featured in the short stories: namely, humans, heptapods, digients, and superhumans. A significant difference between them is their origin, which shapes their understanding of messages and context in interactions. For example, after the heptapods and digients become accustomed to human patterns of discourse, their processing speed increases, whereas Leon and Reynolds already possess heightened cognitive abilities that allow them to understand messages at high speeds.

Each story conveys different messages. In "The Story of Your Life," communicators exchange information and teach the other entity their culture and way of life. Similarly, "The Lifecycle of Software Objects" begins in the same manner, with the difference that digients are adapting to the human way of living. In contrast, "Understand" focuses on the exchange of clashing motives between entities. Although these stories differ from one another, they are connected by the main function of the messages – transferring a piece of communicative information to the receiver to invoke an effect.

The short stories use language as a main medium; however, the participants utilise additional technology to further improve the flow of the interactions, such as computers, phone calls and robots. "Story of Your Life" highlights an exchange where both parties do not know the language of the other, therefore making the process of transferring messages rather difficult. On the other hand, "Understand" and "The Lifecycle of Software Objects" have similar approaches. "Understand" contains communicators and receivers, who know the language at almost an identical level. "The Lifecycle of Software Objects" portrays humans as those who know the language and digients – who are progressively learning the language.

Concerning the effects of the interactions, Dr. Banks, Leon, and the digients change drastically. In the short stories, Dr. Banks gains a new perception, allowing her to understand the reason behind her actions. In contrast, Leon isolates himself from socialisation and, after

the clash with Reynolds, loses his sanity. Meanwhile, the digients continuously evolve through each interaction.

In conclusion, the examined works reveal how an entity can change in response to the interactions in which it engages, and the participants showcase the importance of actively contributing to communication in order to produce an effect. Ted Chiang's selected short stories emphasise that communication is not a passive act but a dynamic, reciprocal exchange. These stories further demonstrate how the identity of an entity and meaning are constructed through the reciprocal exchanges. Ultimately, this thesis provides a perspective for the ongoing discourse on the communication between entities in science fiction.

BIBLIOGRAPHY

- Bell, David. *An Introduction to Cybercultures*. New York: Routledge, 2001.
- Chiang, Ted. "The Lifecycle of Software Objects." In *Exhalation: Stories*. New York: Alfred A. Knopf, 2019.
- Chiang, Ted. "Story of Your Life." In *Stories of Your Life and Others*. New York: Tor Books, 2002.
- Chiang, Ted. "Understand." In *Stories of Your Life and Others*. New York: Tor Books, 2002.
- Chiang, Ted. "Why A.I. Isn't Going to Make Art." *The Weekend Essay*. *The New Yorker* 100. Accessed February 13, 2025. <https://www.newyorker.com/culture/the-weekend-essay/why-ai-isnt-going-to-make-art>.
- Crystal, David, ed. *A Dictionary of Linguistics and Phonetics*. 6th ed. Malden, MA: Blackwell Publishing, 2008.
- Dery, Mark. *Escape Velocity: Cyberculture at the End of the Century*. New York: Grove Press, 1996.
- Dery, Mark, ed. *Flame Wars: The Discourse of Cyberculture*. Durham: Duke University Press, 1994.
- de Waal, Frans. *Are We Smart Enough to Know How Smart Animals Are?* New York: W. W. Norton, 2016.
- Dijkstra, Ton, and David Peeters. *The New Psychology of Language: From Body to Mental Model and Back*. New York: Routledge, 2023.
- Hayles, Nancy Katherine. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press, 1999.
- James, Edward, and Farah Mendlesohn, ed. *The Cambridge Companion to Science Fiction*. Cambridge: Cambridge University Press, 2003.
- Keen, Suzanne. *Narrative Form*. 2nd ed. Basingstoke: Palgrave Macmillan, 2015.
- Latham, Rob, ed. *Science Fiction Criticism: An Anthology of Essential Writings*. London: Bloomsbury, 2017.
- Latham, Rob, ed. *The Oxford Handbook of Science Fiction*. Oxford: Oxford University Press, 2014.
- Pan Macmillan. "Ted Chiang." *Authors*. Accessed February 11, 2025. <https://www.panmacmillan.com/authors/ted-chiang/2417>.

- Pinker, Steven. *The Stuff of Thought: Language as a Window into Human Nature*. New York: Penguin Books, 2008.
- Rando, David P. *Doing Animal Studies with Androids, Aliens, and Ghosts: Defamiliarizing Human-Nonhuman Animal Relationships in Fiction*. London: Bloomsbury Academic, 2023.
- Reznikova, Zhanna. *Studying Animal Languages without Translation: An Insight from Ants*. Cham: Springer, 2017.
- Roberts, Adam Charles. *The History of Science Fiction*. 2nd ed. London: Palgrave Macmillan, 2016.
- Santa Fe Institute. "Ted Chiang." Profile. Accessed February 11, 2025.
<https://www.santafe.edu/people/profile/ted-chiang>.
- Wiener, Norbert. *Cybernetics: Or Control and Communication in the Animal and the Machine*. 2nd ed. Cambridge, MA: MIT Press, 1961.