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To my mum and dad, without whose help I couldn't have come so far.

To have a second language is to possess a second soul.

Charlemagne, 800 AD

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Introduction

The aim of this thesis is to examine how the Sapir-Whorf hypothesis is processed in a sample of recent Western movie representations through the use of constructed languages. The main claim of the Sapir-Whorf hypothesis is that the structure of a language influences its speakers' perception of reality and shapes their habitual ways of thinking. While the strong version (linguistic determinism) of the Sapir-Whorf hypothesis has been subject to rejection by modern scholars, the weak version (Neo-Whorfianism), which emphasizes language's influence on categorical perception and attention, remains a topic of deeper intellectual exploration. This thesis argues that cinematic constructed languages (conlangs) act as narrative and ideological thought experiments that can encode obligatory linguistic features and thereby transform linguistic relativity from a cognitive hypothesis into a world-building device for representing worldview in fictional societies. Due to their creativity and flexibility in style, conlangs have been a popular choice for science fiction narratives and movies. By using conlangs that possess culturally encoded features, movies can transform linguistic theories into an abstract form on screen since conlangs give both creators and intended speakers a chance to reflect a distinct worldview. Science fiction, more than any other genre, not only tolerates such linguistic structures as conlangs but requires them. Extraterrestrial minds or post-imperial societies need not merely speak differently, but they must *think* differently. Conlangs, therefore, act both as narrative mechanisms and as ideological tools. This thesis aims to address the three research questions:

1. How is the Sapir-Whorf hypothesis represented in contemporary cinema?
2. Which features of conlangs encode worldview?
3. How does each conlang affect its speakers in terms of worldview?

The movies selected for analysis are *Arrival* (2016), *Avatar* (2009, 2022), and *Dune* (2021, 2024). Despite presenting different interpretations of the Sapir-Whorf hypothesis, all three movies display a reflection of linguistic relativity using conlangs. *Arrival*'s heptapods, for instance, explicitly model the strong version of the Sapir-Whorf hypothesis by reorganizing temporal cognition. The languages in *Avatar* (Na'vi), and *Dune* (Chakobsa) encode specific cultural perspectives in a neo-Whorfian manner. These representations provide a rich environment for linguistic comparison across conlangs. Therefore, within the analyses of this thesis, how alternative grammars of conlangs might affect and reflect their speakers, as well as their scientific plausibility in light of the recent research findings, will be examined.

Given the limited scholarly work on the representation of linguistic relativity in cinema, this thesis seeks to address this gap in the literature. The flow of this study is going to be structured as follows: First, the necessary background for the Sapir-Whorf hypothesis will be given in order to facilitate comprehension of the overall study. Second, the reflection of the Sapir-Whorf hypothesis and neo-Whorfian stance in movie adaptations will be discussed. Then, an in-depth analysis of the selected movies and the conlangs utilized will be provided. This study adopts a qualitative, interpretive approach to cinematic constructed languages and focuses on how their linguistic design is portrayed narratively and ideologically within fictional worlds. The criterion for selection of the movies is based on their portrayal of non-native protagonists who acquire a constructed language over the course of the narrative, rather than being presented as native speakers from the outset.¹ The analysis does not intend to test the validity of linguistic relativity, nor does it argue that the movies offer explicit evidence for it. Rather, linguistic relativity will be used as a conceptual reading for interpreting how language is framed within the narrative and thematic structure of the movies. The focus of the analyses will be fixed on textual (grammar, lexicon, etc.) and ideological levels. Eventually, the findings will be discussed in relation to broader debates on linguistic relativity and cinematic representations.

1. Linguistic relativity on screen

1.1. Sapir-Whorf hypothesis in brief

Sapir-Whorf hypothesis, also referred to as *Linguistic Relativity*, is notably one of the most heavily debated topics in the field of linguistics. Whorf was a student of Sapir's at Yale

¹It is possible to identify other films featuring a conlang, such as the *Star Trek* original-cast film series (1979–1991) and *The Lord of the Rings* trilogy (2001–2003), as known most. However, they were excluded from this study in order to keep its scope manageable and focused for the purposes of the qualitative research. Besides, as the mentioned productions mainly feature native speakers of conlangs, they do not meet this study's criterion of featuring a non-native protagonist acquiring the constructed language over the course of the narrative.

University, and they shared a common belief that different languages have the power to influence the way humans see the world and even relatively alter their perception of reality, which lays the foundation for their hypothesis. It took linguistic relativity many years and many scholars to get to its status today. Both Sapir and Whorf were influenced by previous scholars as well as their instructors who worked in the field while shaping their claims. Starting with Wilhelm von Humboldt, there were many scholars arguing the power and influence of language on thought as early as the nineteenth century. Humboldt's (1988)² suggestion was that people unintentionally create different inner worldviews in relation to the language they speak. He separated this worldview category into two: *Weltansicht* (the linguistic worldview inherent in a language) and *Weltanschauung* (the ideological worldview) in German, which don't have literal translations in English. These concepts, translated most superficially as worldview in English, represent two different kinds of worldview. According to Humboldt, each language constitutes a unique "view of the world" that is *Weltansicht*, which represents the linguistic worldview imposed by the native language of the speaker, not shaping what speakers think, but how they habitually conceptualize their environment. *Weltanschauung*, on the other hand, represents a rather ideological worldview of a person shaped by society and culture. Humboldt argued that *Weltansicht* encloses *Weltanschauung*, and when a specific *Weltansicht* is imposed, it leads to a different *Weltanschauung* due to the language. Humboldt also inherited the idea that language is the formative organon of thought, and that it is impossible to think without a language from previous thinkers such as Jean Georges Hamann and Johann Gottfried Herder (Underhill, 2009: 59). Therefore, for Humboldt, language is a formative element that shapes thought, and thinking requires a language. He referred to language as a living thing rather than a static phenomenon and attributed this living state to language because we as humans reside in it.

Language, regarded in its real nature, is an enduring thing, and at every moment, a *transitory* one. Even its maintenance by writing is always just an incomplete, mummy-like preservation only needed again in attempting thereby to picture the living utterance. In itself, it is no product (*Ergon*), but an activity (*Energeia*) (Humboldt, 1988: 49).

Following Humboldt, Edward Boas took this argument of language guiding thought to a cultural level. Boas (1911) believed that the form of a language is intimately connected with the habits of thought of the people who speak it. He drew attention to how grammatical categories vary across languages and subtly guide speakers' attention to particular aspects of experience. His point was that each language provides different obligatory categories (e.g., number, gender,

² Original work published in German in 1836.

tense), meaning grammatical systems *oblige* their speakers to notice certain details. He argued: “[...] the categories of language compel us to see the world arranged in certain definite conceptual groups which, [...], are taken as objective categories and which, therefore, impose themselves upon the form of our thoughts” (Boas, 1920: 320). Boas also argued that the speaker of a specific language can express what the language allows and obliges them to express, which eventually directs the attention of its speakers. He stated, “...grammar performs another important function. It determines those aspects of each experience that *must* be expressed” (Boas, 1938: 132). While believing that language and culture are inseparable and culture greatly affects language, Boas didn’t stand for the idea that this effect is bilateral, and that language may affect culture as well. He explains:

It does not seem likely [. . .] that there is any direct relationship between the culture of the tribe and the language they speak, except in so far as the form of the language will be moulded by the state of culture, but not in so far as a certain state of culture is conditioned by morphological traits of the language. (1911: 67)

What Boas argued was rather that languages classify our world-perception, and when a language lacks a specific word, it is not because the speakers are not able to convey that idea, but simply because their culture and language don’t feel the need to express it (Boas, 1973). This cultural-linguistic relativism laid the foundation for Sapir and Whorf’s later hypothesis that language and thought are mutually shaping. Nevertheless, while Boas establishes the groundwork for later linguistic relativity by emphasizing the relationship between grammatical categories and habitual thought, he explicitly rejects a strong causal relationship between language and culture. Sapir and Whorf extended this position by reframing language as an active structuring force in cognition and marked a theoretical shift from Boas’s cautious cultural particularism toward a more robust account of linguistic influence on perception and thought.

Influenced greatly by Boas as his student, Sapir believed that language is a guide to “*social reality*” (Sapir, 1929: 209) and transformed Humboldt’s ideas into culturally acquired constructs. Sapir takes language and culture as one, and language being strongly interconnected with experience. Accordingly, he argued that it is nonsensical for one to think that everyone experiences the same reality since the same experience might be encoded differently in different languages via expressions. These expressions, though seeming insignificant, become a habit and influence our perception of events.

[...] The ‘real world’ is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as

representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached (Sapir 1985: 162).

Lucy (1992) highlights that Sapir saw thought as arising from the interpretation of language classifications and extended Boas's insights by emphasizing that each language organizes concepts into a coherent but *incommensurate* system. What can be deduced from incommensurate systems is that each language has arbitrary ways to describe the world and events. These ways, eventually, grow to have the power of directing the attention of speakers of different languages, and this becomes a habit of thinking via language. A famous example given by Sapir is the sentence "*The farmer kills the duckling*" (Sapir, 1921: 86–98). He breaks down this sentence into its properties and contrasts it with other languages, such as German and Yana. He underlines that whereas the English sentence doesn't necessarily need to express specific features such as number, case, and gender, for other languages, this is unavoidable. His point was that, however an experience might look the same, the way it is perceived and internalized might differ from speaker to speaker. A similar example is given by Boroditsky & Fausey (2011): whereas in English, the act of breaking the vase is narrated as "She broke the vase", in Spanish, a non-agentive expression is favoured: *Se rompió el jarrón* 'The vase broke itself'. Even such a seemingly slight difference in narration resulted in English speakers remembering the agents of events better than the Spanish speakers.

Whorf, building upon Sapir's ideas, took the argument of language shaping thought to a more advanced state and proposed linguistic relativity in its current form. Whorf establishes a similar connection between Einstein's general relativity and linguistic relativity. (Deutscher, 2010) According to Whorf, just as the speed of light is the same for every observer, but, on the other hand, "the moment" is relative to each of the observers, there are different ways of explaining phenomena in distinct languages, even though there is seemingly a reference point that is the external world. As stated by Whorf, the native language of one influences thought and perception. Therefore, different cultures may describe the same phenomenon differently.

We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds, and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way—an agreement that holds throughout our speech community and is codified in the patterns of our language. (Whorf, 1956: 213)

Whorf's *kaleidoscopic effect* analogy can be read as meaning that every speaker of a language has a kaleidoscope in their mind, and thus they see the world in different ways. The world is the same; its objectivity is unquestionable, but its qualities may be perceived differently by speakers of other languages (Batisti, 2019). Today, linguistic relativity as proposed by Whorf is known to have three main assumptions: 1. A and B are two different languages. 2. Differences in A and B languages are also related to the differences between the cultures of language A and language B. These two assumptions are known as the “weak” version of linguistic relativity. 3. The structure of language A determines behavioural patterns in culture A. This is known as the “strong” version of linguistic relativity. (Brown, 1967: 10–11) According to the strong version, language *determines* thought, that is, the view called linguistic determinism. On the other hand, the weak version of linguistic relativity, also known as *Neo-Whorfianism*, claims that the mother tongue *influences* thought and perception, and is called linguistic relativity (Kaye, 2009: 118).

Modern scholarship, as well as the neo-Whorfian tradition, has largely rejected strong determinism since it is found to be incompatible with cognitive flexibility, creativity, and universal features of human cognition (Pinker, 2005). Yet the weak version, which claims that language influences perception, directs attention, and creates a habitual interpretation, remains supported by many (Lucy, 1992; Gumpertz and Levinson, 1996; Casasanto and Boroditsky, 2008; Deutscher, 2010). In his comparative study on Guugu Yimithirr people (Indigenous Australian people whose language belongs to the Pama-Nyungan language family), Levinson (1997) observed that since the people of Guugu Yimithirr use different ways of locating objects in space that privilege cardinal directions rather than egocentric “left” and “right”, the speakers had no difficulty in maintaining orientation (know where north/south/east/west lie) even when sitting still, traveling, or at night, and were faster in encoding and recalling spatial information in terms of absolute directions.³ He concludes that even though language is not a means to determine thought, it can bring about domain-specific impact and therefore influences thought in specific ways. Lucy (1997: 99) stresses: “[...] it is self-evident that certain linguistic distinctions force attention to certain properties of the world.” In the case of Guugu Yimithirr, the certain properties were cardinal directions and orientation. The example of Guugu Yimithirr concretizes how habitual attention is encoded in language. Similarly, Boroditsky (2001) draws attention to the domain-specific influence of native language on thought with her experimental study comparing Mandarin with English. In Mandarin, time is expressed vertically, while it is

³ See also: Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition*, 75(1), 1–28.

expressed horizontally in English. These expressions can be observed in spatial metaphors in everyday speech. In Mandarin, earlier events are described as *up* and later events as *down*. For example, the word *shàng* ‘up’ can refer to earlier times, such as *shàng zhōu* ‘last week’, while *xià* ‘down’ refers to later ones, such as *xià zhōu* ‘next week’. In English, on the contrary, time is typically conceptualized along a horizontal axis, where the future is thought of as *ahead* and the past as *behind*, which is reflected in expressions such as “looking forward to the future” or “putting the past behind.” Through the study, it was found that native Mandarin speakers continue to think of time vertically even when switched to English. According to Boroditsky, language is an effective tool for developing abstract thinking because acquiring abstract concepts and giving them final form is directly related to linguistic experience rather than sensory experience (Boroditsky, 2001). In more concrete phenomena like colour, however, language may fall short of yielding the same result. Today, we know that while some languages conceptualize colours in a very detailed way, some lack this distinction. This, once again, brings about the idea that we describe the world to the extent our languages allow or direct us to express. A 2008 study by a team from universities including Stanford, MIT, and UCLA⁴ examined how Russian, which is famous for having two different words for blue (*goluboy* ‘light blue’ and *siniy* ‘dark blue’), affects its speakers’ colour perception. The team suggested that since detailed colour names impose certain habits in the mind, people become more sensitive to colour discrimination. For example, Russian speakers, owing to the encoding of the distinction between dark blue and light blue in the lexicon, were more successful than English speakers in finding the desired colour within a range of hues. The above-mentioned studies share a common insight: that is, languages differ not in what their speakers can perceive, but in what they habitually pay attention to perceive. Linguistic categories of different languages highlight some features, whereas backgrounding others through the lens of language (Boroditsky, 2001; Levinson, 2003). It is apparent that every language processes and portrays the same physical world, but in ways that are distinctive and unique to each language. Consequently, it is the relationship between what the eye can see and what the language is able to describe. Language is the manner through which our attention is drawn to specific aspects in universe via both culturally and socially encoded constructs in our way of speaking that have

⁴ Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., & Boroditsky, L. (2007). Russian blues reveal effects of language on color discrimination. *Proceedings of the National Academy of Sciences of the United States of America*, 104(19), 7780–7785.

been shaped by the habits of the speakers. Uygur (2019: 82–84) explains this phenomenon as such:

Every language, by virtue of being a language, organizes the universe and existence in its very structure linguistically. [...] Language is a way of understanding the world. [...] In a realm of reality within the world, the order that one language declares to “exist” and “make existent” is not identical to that of another language. [...] For instance, in Turkish, we talk about the sun’s “being born”. [...] In many contexts, the sun is “born” in Turkish. Although today, even children know that the sun is not “born”. However, long ago, when Turks used to interpret everything in the universe as living beings, it was not the case. The sun’s birth was perfectly accurate back then. The expressions we use today are thereby products of such an ancient understanding of the existence of a worldview that does not conform to many of today’s obvious truths.⁵

However, while neo-Whorfian tradition continues to be supported by experimental data, some scholars remain deeply sceptical. Steven Pinker, for instance, stands as one of the most prominent critics of linguistic relativity and rejects the notion that language plays any constitutive role in shaping thought. Pinker takes linguistic categories as superficial labels attached to pre-existing mental representations. He proposes instead the concept of *Mentalese*, a hypothetical *language of thought* that exists independently of natural languages. He argues that meaning does not emerge from lexicon or syntax but from an innate language of thought. His own words, “People do not think in English or Chinese or Apache; they think in a language of thought” (Pinker, 2007: 81) attribute speech only a medium role for exchanging ideas. Pinker’s critique goes beyond simple scepticism regarding strong determinism. Rejecting the strong version of linguistic relativity, Pinker believes people can have a way of thinking outside of a specific language, and they would still be able to convey their ideas through mentalese. “Knowing a language, then, is knowing how to translate mentalese into strings of words and vice versa. People without a language would still have mentalese, and babies and many nonhuman animals presumably have simpler dialects” (Pinker, 2007: 82). Beyond Pinker, generative and cognitive universalist views have raised similar objections. Chomsky’s tradition, for instance, rejects linguistic relativity on the grounds of Universal Grammar, claiming that all languages are generated from a shared underlying cognitive architecture (Chomsky, 1965, 1986). This view argues that while languages differ superficially, the cognitive operations that guide syntax and recursion are universally shared. Fodor (1975), too, anticipates Pinker’s claim by proposing that cognition is fundamentally modular and language-independent, and that perception and categorisation arise from innate mental structures, not from linguistic encoding.

⁵ English translation from the original Turkish.

Critiques have also targeted the methodology of Whorfian arguments. Early Whorfian claims, though influential, were often based on anecdotal ethnographic notes. Pullum (1991) emphasizes that some of Whorf's most famous examples, such as the claim that the Hopi have no concept of linear time, were proven to be false, as also argued by Malotki (1983) in his seven-hundred-page work on the time concept of the Hopi. At the same time, Pullum claimed that Whorf misinterpreted Boas' ideas and used them rather vaguely in his works. Some contemporary critics also caution against over-interpreting neo-Whorfian experimental results. Gleitman and Papafragou (2005) argue that while language can bias attention during tasks, these effects are task-dependent rather than constitutive of thought. In their view, speakers of languages with grammaticalized spatial or temporal distinctions do not perceive the world differently in a literal sense. Instead, they momentarily notice certain dimensions when prompted linguistically. Gleitman and Papafragou (2005: 653) conclude that language can direct attention but does not necessarily sculpt cognition.

[...] compelling experimental studies again and again document intimate, seemingly organic, relationships among language, thought, and culture, of much the kind that Whorf and Sapir drew out of their field experiences. What is to explain these deep correlations between culturally divergent ways of thinking and culturally divergent ways of talking? In certain cases, we argued that cause and effect had simply been prematurely placed on one foot or another because of the crudeness of our investigative tools.

Language influences thought “on line” and in many ways. For the learner, the particular speech events that one experiences can and do provide cues to nonlinguistic categorization – that is, a new linguistic label “invites” the learner to attend to certain types of classification criteria over others.

Taken together, the critiques mentioned are seen to have emphasized that while linguistic categories may influence attention, they do not play a role in determining conceptual possibilities. They argue that language may influence habitual patterns of interpretation, but it does not play a determining role in shaping thought. Yet, for this study, the scientific validity of the Sapir-Whorf hypothesis is secondary to its narrative potency. Cinema, unlike natural linguistic environments, offers specifically designed linguistic systems that are not bound by organic evolution. Instead, conlangs are born from intentional designs to carry their communities' properties. In movies, these languages can exaggerate or isolate particular features and dramatize alternative modes of perception because they are constructed retrospectively, with linguistic structure built to suit an imagined culture rather than emerging through organic social use. The following section examines science fiction as the genre where

linguistic speculation is essential and how constructed languages may become narrative and ideological thought experiments within imagined worlds.

1.2. Science fiction and constructed languages as narrative thought experiments

While the debates on linguistic relativity centre around analyses of natural languages, fictional narratives, especially those in science fiction, have increasingly entered the discussion by proposing languages engineered for specific purposes. Before turning to how constructed languages are utilized in science fiction, it would be useful to briefly discuss the science fiction genre itself. Though every individual has their own understanding of science fiction, it is still possible to draw borders for it. Roberts (2006) highlights that science fiction consists of three principal forms: space travel, time travel, and imaginary technologies.

‘Science’ in Science Fiction has always had a tacit meaning other than that commonly accepted. [...] It means only, finally, that whatever phenomenon or speculation is treated in the fiction, there is a claim that it is going to be studied to some extent scientifically—that is objectively, rigorously; in a controlled environment. The business of the writer is to set up the equipment in a laboratory of the mind such that the ‘what if’ in question is at once isolated and provided with the exact nutrients it needs (Jones, 1999: 4).

According to Roberts (2006: 7), Jones (1999) describes the genre as a disciplined form of thought-experimentation. This interpretation of science fiction as an experimental site provides us with the necessary bridge to conlangs. If the genre is, as Jones suggests, a laboratory of the mind, then conlangs become one of its most basic instruments within fictional worlds because they allow creators to manipulate the medium through which imagined worlds are perceived and experienced, that is, language. The genre’s speculative frame allows language to become not simply a communicative tool within a story but a structural mechanism.

We can also draw another line here in what separates science fiction from fantasy, which often gets mixed up with science fiction. Whereas in the world of fantasy works, the rules of nature are somehow altered, science fiction demands that its audience *assume* a world that has been altered either by technology or extraterrestrial creatures (Gunn, 2000). Fantasy, in this sense, makes the impossible possible because the magic or myth in it doesn’t need to be validated, as the audience is already assumed to have accepted them without further explanation. Science fiction, by contrast, requires its strangeness to be explainable, at least in principle. In 1979, author Darko Suvin coined the Latin term “*novum*” (pl. *nova*) for new but logically explainable phenomena in science fiction. “SF is distinguished by the narrative dominance or hegemony of a fictional “*novum*” (novelty, innovation) validated by cognitive

logic” (Suvin, 1979: 63). A *novum* can be a spacecraft, time machine, genetic mutation, etc., so long as it appeals to logic. In the context of movies that are selected for analysis within this thesis, genetic engineering in *Avatar*, heptapods in *Arrival*, and colossal sandworms in *Dune* (Ryding, 2021: 117) are all outstanding examples of *novum* in science fiction. What follows from Suvin’s model is that languages in science fiction do not merely signal alienness but perform cognitive labour by altering what counts as thinkable, or even real. Conlangs thus join *novum* as speculative instruments through which the genre investigates the boundaries of human and non-human cognition.

Having briefly held an account of science fiction, we can now turn to constructed languages. Movies frequently employ constructed languages not simply for artistic purposes, but as tools for examining how alternative linguistic systems might reshape identity and create alternative worlds. The process of creating new languages, namely *glossopoesis*, itself can be seen as a *novum* that reflects creators’ intentions and allows them to build fictional worlds (Noletto, 2022). Ene (2024) highlights “In the context of moviemaking, constructed languages serve as a tool for immersive world-building, particularly in genres like science fiction and fantasy” (2024: 78). Fimmi & Higgins (2017: 22) explain that “Indeed, “con-langs” (constructed languages) or “art-langs” (art languages) have been used widely to support and enhance world-building, though with varying degrees of complexity and completeness.” In 1928, the term *conlang* (a blending of constructed language) was coined for the first time by the Danish linguist Otto Jespersen in his book *An International Language*. People who construct these languages are, therefore, called *conlangers*. Conlangs emerge artificially and are human-made phenomena that are intentionally developed to serve a specific purpose (Peterson, 2015; Sanders, 2020). Conlangs are also reflections of their creators’ understanding of a language and the culture they were born in. In a sense, they mirror the motives and aspirations of the conlangers as well as the points they think are lacking in natural languages (Adams, 2011). Okrent (2009: 15) describes the primary purpose of developing a new language as “to improve upon natural language” and therefore creating a flawless language. Yet, the purpose of creating a new language goes beyond just the desire to create a better language. Adams (2011) lists seven motives for one to create a new language in addition to being dissatisfied with a natural language.

1. Filling a language gap: Creating a language to provide a group with a relevant language or a language that can express their needs.

2. To study a linguistic theory: Some languages are created to test the boundaries of linguistic theories, such as the Sapir-Whorf hypothesis.⁶
3. Practicing linguistic techniques: One may create a language not because a community needs it, but because the inventor wants to exercise the craft itself to test phonological, morphological, or stylistic aspects. Some conlangs are therefore devised as a stylistic or technical exercise in a way that allows the creator to explore phonological elegance⁷ and syntactic invention for its own sake rather than to meet communicative needs. For example, Tolkien's Elvish primary motive was to address aesthetic beauty.
4. Promoting a plot or character: Lord of the Rings, Star Trek, and many gaming languages were designed with the aim of giving a distinct and unique voice to their speakers.
5. As a political act: Since inventing a language will give voice to intended groups, it can promote cultural as well as ideological intersections.
6. Fame and money: As humans, money and reputation are two of the major driving forces in our actions. Most of the invented languages are included in high-profit movies; therefore, they have the capacity to bring about a good amount of income.
7. Pleasure and aesthetic value: Overall, one may invent a language just because they enjoy creating something from scratch and find the newly invented languages aesthetically appealing. Tolkien⁸ frequently expresses his pleasure in just *doing so*.

It is possible to divide conlangs into three main categories according to their purpose of creation. *Artlangs*, *auxlangs*, and *engelang*s. Artlangs (Artistic languages) are constructed primarily for artistic and creative purposes, for instance, to be used in fiction such as Tolkien's Elvish. Auxlangs (Auxiliary languages) are created to act as a *lingua franca* and be as simple as possible to ease the communication process among societies. Perhaps one of the best-known examples of an auxlang today is Esperanto. Lastly, an Engelang (Engineered language) is created to possess specific features such as a limited lexicon or a distinct worldview. For example, Suzette Haden Elgin's Láadan in her *Native Tongue* series of novels was crafted to portray women's world perception and is therefore categorised both as an artlang and an engelang (Sanders, 2020). In the introduction to her dictionary of Láadan, Elgin (1988)

⁶ See Loglan by Dr. James Cooke Brown, and Láadan by Suzette Elgin.

⁷ The word *Sprezzatura* by Baldassare Castiglione was also invented for such motive back in 1528 and appeared first in his book *Il Cortegiano*. (Adams, 2011) As explained by Castiglione, the word refers to the art of nonchalance about what is being said or done, simply having an elegant attitude without paying attention to it, which is reflected also in the structure of the word.

⁸ Tolkien's lecture on inventing new languages: Tolkien, J. R. R. (1983). A secret vice. In C. Tolkien (Ed.), *The monsters and the critics and other essays* (pp. 198–223). Houghton Mifflin.

describes Láadan as “a language constructed by a woman, for women, for the specific purpose of expressing the perceptions of women.” It is also useful to mention a subcategory of englangs that is named *Loglang* (Logical language). Loglangs are constructed in the most unambiguous and regular way to test philosophical hypotheses. Dr. James Cooke Brown created the first Loglan (called Loglan) in 1960, intending to test the Sapir-Whorf hypothesis and whether the thinking patterns of speakers would really change. Later, it was followed by languages that were derived from Loglan: Ceqli, Lojban, and Lojks (Cheyne, 2008). It is also possible to divide conlangs into two other categories according to the manner of their creation. Couturat & Leau (1903) classify International Auxiliary Languages (IAL) into two categories based on their status of being constructed from existing languages or not: *a posteriori* and *a priori* languages. This classification can be extended to all constructed languages in general. An *a posteriori* conlang is built on and derived from an already existing language. An *a priori* conlang, on the other hand, is created from scratch with no contact or derivation from other languages. Nevertheless, it should be noted that even languages classified as *a priori* type will inevitably reflect the native language of the creator or other existing languages. Therefore, constructing an *a priori* conlang requires a considerable amount of effort, as conlangers should possess sufficient linguistic knowledge of other existing languages in order not to create a language different in lexicon but the same in structure (Emrys *et al.*, 2009: 3).

Cinematic conlangs can be viewed as narrative thought experiments within fictional worlds. Science fiction, in particular, provides a fertile site for examining how a language can influence perception, both within fictional worlds and among audiences interpreting them. Conlangs go beyond exploring the possible ways of thinking. They also reflect the ideologies of the societies that use them. For instance, in the *Avatar* series, the conlang Na’vi features several elements reflecting the importance Na’vi people attribute to nature. Crucially, the function of conlangs in movies diverges from academic thought experiments such as Loglan or Lojban. Loglangs attempt to eliminate ambiguity for the sake of testing rationality. Cinematic conlangs, by contrast, retain enough flexibility for identity and worldview to be reflected in the linguistic system. As Frommer (2022) highlights, “Every language reflects the environment and culture of its speakers; this is no less true for a fictional world than for a real one.”⁹ However, this order is inverted in cinematic conlangs. Whereas natural languages reflect the culture of their speaking community, in cinematic conlangs, an imaginary culture is articulated first, and the language is then engineered to embody it. Here, it is the imagined

⁹ Access the interview at: <https://www.campfirewriting.com/learn/interview-paul-frommer> (Last accessed 23.07.2026)

culture that shapes the language, which in turn places speakers in a constructed subject position.

A further dimension relevant to this discussion is the potential relationship between second language acquisition and its effects on individuals' worldviews and conceptual categories, since the films examined within this thesis feature protagonists who adopt a second language and subsequently experience shifts in their worldview and conceptualization of their surroundings. The potential influence of second language acquisition on perception and conceptualization has been explored in a number of empirical studies. For instance, Athanasopoulos (2009) investigated the perception of colour in native Greek speakers who were also speakers of English as L2, and English monolinguals. In the study, Greek-English bilinguals and English monolinguals were asked to judge whether there was any similarity between the given light- and dark-blue colour squares.¹⁰ The result of the experiment showed that bilingual speakers who had spent more than two years in an L2-speaking country tended to use their L2 norm in their perception of colour (Athanasopoulos, 2012). Further evidence comes from Cook *et al.* (2006). Their experiment attempted to answer whether learning a second language can impact how people view the world by investigating whether Japanese adults learning English categorise objects by their shape or by the material they are made of. In a matching task with everyday items and substances, participants (36 Japanese L2 users of English, divided into two groups as a short-stay and a long-stay group who had lived in an English-speaking country) had to choose whether a target object was more similar to another item of the same shape or the same material. It was observed that Japanese speakers who lived in an English-speaking country for over three years chose shape significantly more often for simple objects than those with shorter stays.¹¹ Another category of exploration in relation to second language acquisition is the time perception of bilinguals. Li *et al.* (2019) examined whether Chinese spatiotemporal

¹⁰ Greek has two distinct terms for the dark and light shades of the colour blue.

¹¹ Imai and Gentner (1997) illustrate that while English speakers cannot modify a mass noun with numerals, they still need to employ quantification of mass nouns through the use of classifiers, such as *a glass of wine*. Japanese, however, lacks such quantification. In cases where quantity must be expressed, all Japanese nouns are acknowledged as mass nouns and are quantified by numeral + classifier. Accordingly, while English speakers are mentally obliged to notice things as either objects or substances for executing mass or count differentiation, Japanese speakers do not differentiate between the types of nouns. In their experiment, Imai and Gentner (1997) observed that while adult monolingual speakers of Japanese classify items according to their material, adult monolingual speakers of English classify items according to their shape. Therefore, the fact that Japanese speakers who stayed in an English-speaking country for more than three years shifted towards selecting shape shows that they acquired a characteristic of native English speakers' thinking since as Cook *et al.* (2006: 141–142) explains “English speakers have to constantly decide whether something is an object or a substance in order to apply the correct mass/count noun distinction, so that, whenever something has a shape, albeit extremely simple, it is classified by the English speakers as a count noun, that is, an object.”

metaphors (e.g., *hou-tian* ‘day after tomorrow’ is back-day and the *qian-tian* ‘day before yesterday’ is front-day) unconsciously interfere with time conceptualization when bilinguals use their first (L1) versus second (L2) language. The results revealed that when bilinguals performed the task in English, hearing a term from a location that mismatched with its Chinese metaphor (e.g., hearing “Friday” from the front side on Wednesday) produced a significantly larger N400 response¹² (an indicator of an unconscious semantic conflict). In contrast, this effect of conflict disappeared when speaking Chinese. The relationship between the perception of conceptual categories and second language acquisition could be explored further; however, the above-mentioned experiments provide sufficient insight for the present discussion. Given that shifts in perception have been demonstrated in empirical research in the context of second language acquisition, these findings can provide a basis for examining whether the shifts observed in the protagonists’ perceptions and conceptualizations can be associated with their adoption of a second language and eventually linked to the linguistic relativity hypothesis.

1.3. Neo-Whorfian reimagining

In contemporary cinematic representations, linguistic relativity tends to be portrayed mostly in its weak form (Neo-Whorfian), in contrast to the strong, deterministic claims often encountered in written science fiction works. Thus, it is very rare to find movies representing the deterministic version of language relativity, except for some exceptions such as *Arrival* (2016). However, *Arrival* remains consistent with the scope of this thesis, as its portrayal of linguistic determinism is restricted to a specific cognitive domain, namely, temporal perception. In this sense, the movie can also be read as an extreme dramatization of domain-specific linguistic influence, which is compatible with the neo-Whorfian understanding of language rather than a claim of a holistic cognitive determination. On the other hand, the rest of the movies selected for detailed analysis continue to adopt a neo-Whorfian stance and reflect the idea of languages having the ability to influence thought in a categorised manner with neo-Whorfian thinkers. Therefore, it is crucial to note that these movies employ linguistic relativity mostly as a symbolic device and not as a rigorous cognitive claim. Towards the end of the 20th century, motion picture producers started to hire more and more professional conlangers for their movies, which made language, and therefore their world, a linguist’s domain (Fimmi &

¹² In neuroscience, event-related brain potentials (ERPs) are used to examine neural activity with millisecond-level temporal resolution (ms) via electroencephalography (EEG), a method that records electrical activity from the scalp. N400 is a negative-going ERP component that is observed in the EEG signal upon the presentation of semantically incongruent stimuli, and it typically peaks around 400 ms after stimulus onset (Ibanez *et al.*, 2012).

Higgins, 2017). This professionalization eased the depiction of neo-Whorfianism on screen and gave way to languages such as Na’vi, which was built with an underlying conceptual architecture that reflects cultural distinctions and perspectives (Frommer, 2022). Eventually, the involvement of linguistic experts ensured that the differences between the fictional language and any real language are not arbitrary but are strategically placed in obligatory grammatical categories (such as tense, spatial reference, case marking, etc.).

Levinson (2003: 301) highlights, “Whorf emphasized the role that obligatory grammatical categories may have on patterns of thinking, their background character, their obligatoriness and frequency have, in his words, ‘a behavioral compulsiveness’.” Similarly, the conlangs developed for cinematic worlds might encode culturally salient distinctions such as ecology or social hierarchy through grammar and lexicon, and thereby imply corresponding differences in conceptual orientation. However, the reflection of neo-Whorfianism in cinema is not concerned with testing the cognitive impacts of linguistic categories, but it is rather a projection of how language becomes a symbol for ethos. The narrative use of conlangs in cinema is in line with the broader sociolinguistic notion of linguistic performance as well, in which speaking a language correctly is not only communicative but also constitutive (Hymes, 2001).¹³ It is the act through which one becomes a socially recognized participant in a given community. Here, the role of language goes beyond indexing identity; it *produces* it. Competence is not merely grammatical knowledge, but it requires the ability to use language appropriately within a community’s norms and values. Speaking *correctly*, therefore, includes mastering culturally specific communicative rituals. One is recognized as a legitimate member of a speech community only through successful communicative performance. This performance also reflects Erving Goffman’s understanding of the performed self¹⁴, wherein social actors must perform the codes and behaviours adopted by a group to be granted social legitimacy. In *Arrival*, *Avatar*, and *Dune* alike, the acquisition of the conlang is to be admitted into its cultural boundaries of belonging. Protagonists do not merely learn vocabulary or grammar; they learn how to inhabit an alternative social ontology. In a sense, mastery of the conlang grants access to culturally specific modes of attention. However, the selected cinematic portrayals rarely expect the audience to engage with the cognitive implications of language. These cinematic representations display alternative worlds that are bound by their language’s attentive and cognitive requirements and habits. Through this lens, neo-Whorfianism in the cinematic context can be read as a re-imagining of relativity as a world-building tool. The three selected movies

¹³ First published in 1977 by Tavistock Publications Limited.

¹⁴ Goffman, E. (1956). *The presentation of self in everyday life*. University of Edinburgh

present a spectrum of how language can be used to delineate the boundaries of consciousness and culture. They allow us to move the debate from theory to narration. The subsequent chapters are dedicated to analyses of the movies and will move beyond the theoretical establishment to perform a detailed linguistic and semiotic analysis of these conlangs. They will focus on both how adopting conlangs affects the characters' development in a socio-cultural environment and how the results of adopting a new linguistic system are visually and narratively represented on screen. The goal is to demonstrate precisely how the textual (phonology, lexicon, grammar) and cultural aspects of each conlang are built to project its speakers.

2. Arrival and temporal perception

2.1. Narrative context of Arrival

Arrival (2016) is a science fiction movie adapted from Ted Chiang's novella *Story of Your Life* (1998). For the screen, it was written by Eric Heisserer, directed by Denis Villeneuve, and released in 2016 by Paramount Pictures. When first released, the movie was met with strong critical and audience reception, and achieved a rating of 7.9/10 on IMDb. The movie stars Amy Adams as the protagonist Louise Banks, Jeremy Renner as Ian Donnelly, and Forest Whitaker as Colonel Weber. The narrative follows Louise Banks, a linguist who is suffering after the death of her daughter at the age of twelve from a rare disease. The movie opens with Louise's inner monologue on memory and time: "We are so bound by time, by its order" (Heiser, 2015: 1). Soon after, upon the appearance of twelve alien vessels at various sites around Earth, Louise is recruited alongside the experimental physicist Ian Donnelly by Colonel Weber from the U.S. military to communicate with extraterrestrial creatures in order to understand their intentions coming to Earth.

During their mission in the Montana base, Louise and Ian encounter two of these seven-limbed aliens that they initially call *heptapods*. Their task is to decipher the heptapods' language and share their findings with other nations. However, communicating with the heptapods is proven to be quite laborious since their spoken and written language is nothing similar to that of humans. Louise begins the communication process by showing the heptapods a sign with the word *human* written on it, and the heptapods' response comes with ink emerging from their limbs. Once Louise builds common linguistic ground and asks the heptapods their purpose for coming to Earth, their response was initially translated as *offer weapon*. Even though Louise argued that it could also stand for a concept closer to a *tool* or a *means*, the translation created an immediate tension among international teams. Crucially, China's interpretation of the message as *use weapon* and causes other nations to break communications with the Montana

base. Meanwhile, Louise finds herself having flashback-like visions of her unborn daughter as she studies the structure of the Heptapod language. The Russian team also translates a message they received as *there is no time*, which was acknowledged as a threat. Shortly after, rogue soldiers are ordered to plant a bomb in the heptapods' vessel to protect humanity. When Louise returns to the vessel after the explosion, she finds herself on the heptapods' side. One of the heptapods communicates to her that the other heptapod is dead as a result of the bomb explosion and explains that they have come to help humanity because they will need humanity's help in return in three thousand years. At this point, Louise finally understands that the so-called *weapon* is in fact the heptapods' *language* and acquiring it distorts humans' linear perception of time, which explains her flashbacks from the future. As the military camp is vacated, Louise continues to experience premonitions and sees an event of United Nations where the decoding of the heptapods' language is celebrated. The General of China expresses his gratitude to Louise for talking him out of attacking the aliens. He explains to Louise that she told him his wife's dying words on the phone, which eventually convinced the General not to attack the vessel. Back in the present moment, Louise sneaks an agent's phone and calls General's number to quote his wife's last words to him. Following this intervention, China does not attack the vessels, and the spacecrafts eventually depart from Earth. In the final moments of the movie, Louise asks Ian, "If you could see your whole life from start to finish, would you change things?" (Heiser, 2015: 114) In response, Ian confesses his love to Louise. At the moment of their speaking, Louise is already aware that she will have a child with Ian despite knowing that their daughter will die, but she still embraces her story.

The beginning of the movie connects to the end. The first scene of the movie starts in Louise's house, where she wanders alone. Afterwards, the opening moments display the birth of Louise's daughter, Hannah, and their moments together, and later shift to her death. The movie ends, again, in Louise's house; however, with one difference: Ian's presence and their decision to have a baby. According to Fernández (2021: 29), this decision to give an irregular chronological presentation of events serves two purposes. Firstly, to set up an anticipated ending. At the end of the opening scenes, the audience automatically assumes that Hannah is dead, which connects to the second purpose: to mislead the audience. Since humans are accustomed to experiencing things in regular chronological order, the audience expects the movie to progress after Hannah's death. However, that is not the case, and the movie continues to narrate the events leading to Hannah's death.

It is important to note that rather than focusing fully on invasion, the movie centres on the process of linguistic decoding and cross-species communication. During the recruitment of

Louise, as well as during the process of deciphering the Heptapod languages, Colonel Weber insists that Louise act as quickly as possible to decipher the language and ask the heptapods their purpose. Louise, on the other hand, is very much aware of the fact that before establishing common ground with the heptapods, it is impossible to reach them. The more she insists on taking the time to set up a shared semantic knowledge, the more she gets pressured by the military to proceed faster. The underlying implication is that miscommunication is the primary source of danger, while cooperation and shared knowledge are the only ways forward. In this sense, the movie is also a portrayal of *xenolinguistics* fieldwork, a subfield of linguistics that deals with deciphering the language of non-human, or extraterrestrial, creatures. Just as in the movie, the focus of xenolinguists is to reveal the system of a non-human language, and the continuous effort in the field is to prepare for a possible alien contact and to be able to communicate with them. *Arrival* is an example of such an alien contact scenario and depicts linguistic fieldwork (Bowern, 2023: 99).

2.2. Heptapods and linguistic systems

As also explained in the movie, the name *heptapod* comes from the combination of Greek words *hepta* (seven) + *pod* (feet). In the movie, heptapods are nicknamed *Abbott* and *Costello*. These aren't, however, arbitrary nicknames. It was Ian who initially gave the heptapods their nicknames, referring to the famous American comedy duo. Abbott, the slightly taller heptapod, and Costello, the more talkative one, as is the case with the comedy duo. To avoid confusion, I will be referring to the Heptapod languages as written and spoken. The linguistic consultants for the movie are Jessica Coon, Lisa deMena Travis, and Morgan Sonderegger, all of whom are professors from McGill University in Montreal, where the movie was shot. Even though Jessica Coon (2018) explains that the Heptapod languages are not classified as a regular conlang and cannot be learned in the way one learns other conlangs, they can be placed within the conceptual languages category in which the reception of a created language is intended to surpass its form and get fixed on the ideas it may carry (Conley & Cain: 10, 2006; Noletto, 2018: 14). Still, it is no wonder the Heptapod languages serve the process of *glossopoesis*, that is the process of language creation (Noletto, 2018: 12). All the symbols that are going to be analysed, except for Image 9, are displayed in the movie itself. Some representations circulating online, such as Image 9, are fan-made and not fully verified against the movie's original material. Similarly, sentence-level translations such as *It wasn't us* and inferred past-tense constructions like *Abbott died* or *Ship grounded* in Image 9 do not appear in the movie's script or on-screen translations. Accordingly, the analysis is restricted to expressions directly presented in the movie.

2.2.1. Spoken language

The spoken, auditory Heptapod language was designed for the movie by Dave Whitehead and Michelle Child and supervised by sound designer Sylvain Bellemare. The heptapods are observed to be not in possession of a mouth or human-like vocal tracts, and articulate sounds through an orifice in their head area. The overall sound design of the movie was intended to be as natural and organic as possible. For this reason, the designers used no artificial sounds such as engine or machine sounds. Instead, Dave Whitehead and Michelle Child collected the Kokako and Tui birdsongs all around New Zealand, did a bagpipe recording using the wind instruments of the New Zealand native Māori people, like the Pūtōrino or the Didjeridu, and adjusted the camels' gurgling noises to obtain sounds suitable for aliens. They also experimented with rice papers to simulate alien breathing as realistically as possible. Spoken language was designed to sound deeper, in contrast to written language, which appears high-pitched. All in all, spoken language is characterized by guttural vocalizations and bursts.¹⁵

In the movie, no precise information about the linguistic structure of spoken language is given apart from the spectrograms (Image 1), graphs that demonstrate the variety of phonetic pitches and frequencies in a given speech. Therefore, most of the grammatical information comes from the novella. Spoken language follows a completely free word order and allows an extensive number of center-embedded clauses (Coon, 2020: 38–39, Chiang, 2002). A free word order contradicts language universals, the idea that human languages share fundamental structural properties, developed more explicitly in *Aspects of the Theory of Syntax* (1965) by Noam Chomsky. In fact, the universality of languages has also been noted by Joseph Greenberg (1963), who sought to study the commonality of world languages and to collect sufficient data to support his hypothesis that all human languages evolved from a single proto-language. (Greenberg, 1971). Chomsky, however, does not hold the idea of a single proto-language from which all languages evolved. Rather, he argues that this commonness stems from the innate language ability of humans (Chomsky, 2005). Pinker and Bloom (1990: 714) list ten Universals of the Chomskyan tradition that are believed to be shared across all natural languages:

1. Major word categories: All languages have noun, verb, adjective, and adverb categories.

¹⁵ Clark, K., Stanze, E. (2017). *Acoustic Signatures: The Sound Design of 'Arrival'* [Documentary], Paramount Pictures.

2. Major phrasal categories: All Languages have noun and verb phrases.
3. Phrase structure rules: Some rules govern how phrases are formed, such as X-bar theory, and these rules can be found across different languages.
4. Syntax: Rules of linear word order of languages.
5. Suffixes for tense marking: Existence of suffixes for indicating time.
6. Auxiliaries: All languages share grammatical elements that affect the meaning of the sentence by expressing aspects like truth value, possibility, or being a statement, question, or command.
7. Anaphoric items: Existence of items that refer to one another within a language such as pronouns.
8. Inventory of phonetically reducible morphemes: Pronouns and other anaphoric elements can convey references to already mentioned subjects within sentences, thereby avoiding repetition.
9. Mechanisms of complementation and control/Recursion: Grammatical mechanisms allow sentences to be embedded within other sentences. This makes it possible to express complex thoughts like beliefs, desires, and intentions without repeating information, such as in *John hopes for Bill to come*.
10. Wh-Movement: A syntactic process where a question word or phrase, such as in wh-questions or relative clauses, moves from its underlying position within a sentence to the beginning of the clause.

Based on these universals, Chomsky assumes that the more than seven thousand languages of the world are so similar to each other that if a Martian scientist were to come to Earth to examine humans, it would think that all humans spoke the dialects of the same language (Deutscher, 2010: 6). Although these universals are subject to criticism regarding the absence of some universals in some languages and falling short of explaining universality assumptions clearly, they remain influential in highlighting structural tendencies shared by all languages. Within this perspective, the spoken Heptapod language represents an extreme departure from the linear organization observed in human languages since it does not rely on sequential syntax as in human languages, where units within a sentence follow one another.

On the other hand, in center-embedded constructions, a clause is inserted into the middle of another clause, often separating the subject from its verb. For example, in a sentence such as “The linguist that the Colonel from Montana base hired translated the message”, the main clause “The linguist translated the message” is interrupted by the embedded clause “the Colonel from

the Montana base hired.” More complex cases may involve multiple embeddings. Such dense recursive compositions bring about high working-memory demands while processing the language syntactically, as the human brain takes a longer time than usual to store the subjects and later connect them with their distant predicates within the sentence (Coon, 2020: 39). The presence of several center-embedded clauses in the spoken language, therefore, suggests that this cognitive load is easier to process by heptapods. Nevertheless, once Louise manages to get Abbott to write and therefore unfold the written language of heptapods, the focus starts to shift to written language, since the spoken language is difficult to segment.

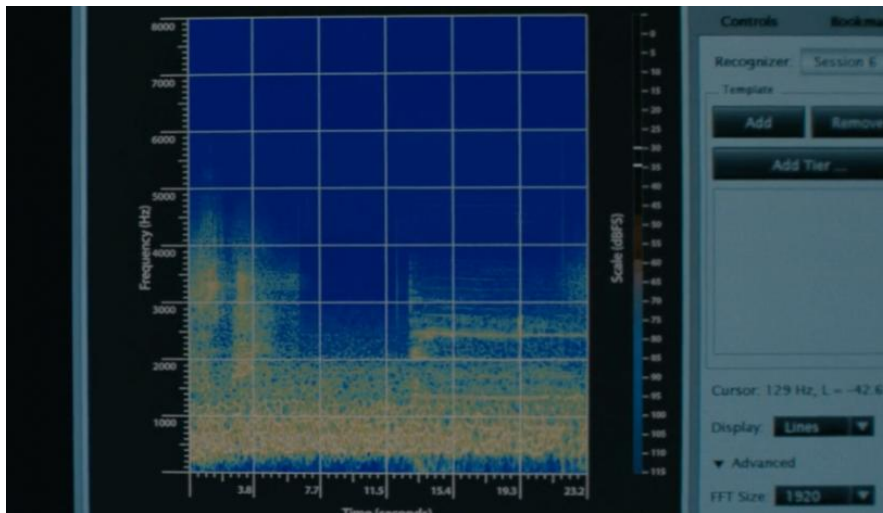


Image 1. Spectrograms of the spoken language presented in the movie.

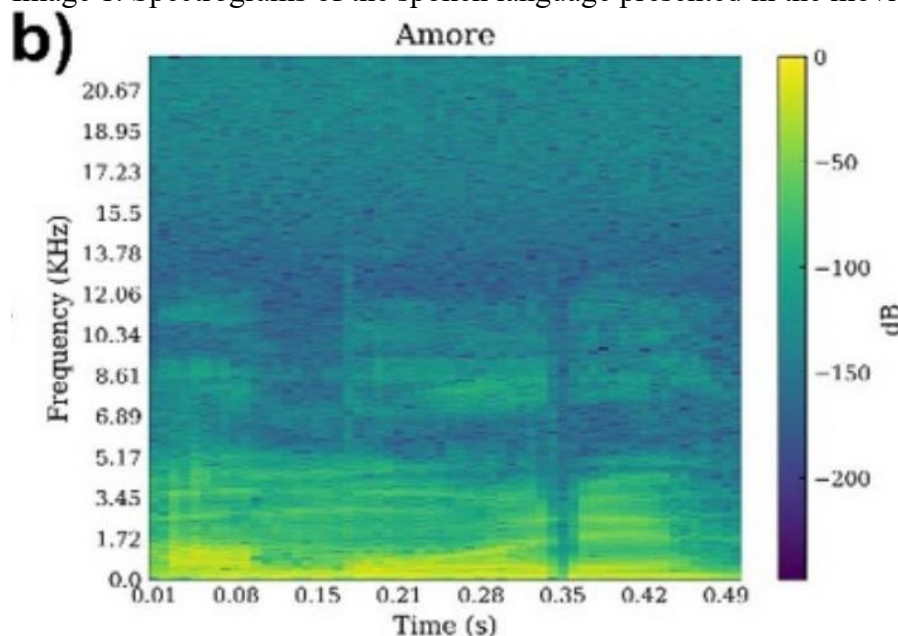


Image 2. Example from a human language: the spectrogram representation of the Italian word *amore* ‘love’.¹⁶

¹⁶ Di Lauro, M., Rondelli, F., De Salvo, A., Corsini, A., Genitoni, M., Greco, P., Murgia, M., Fadiga, L., & Biscarini, F. (2024). An organic artificial soma for spatio-temporal pattern recognition via dendritic integration. *Neuromorphic Computing and Engineering*, 4, 024001.

The difference between the two spectrograms of a human and the written Heptapod language (Images 1 and 2) is noticeable. Human speech shows relatively smooth and horizontal bands that tend to blend into each other. The heptapod spectrogram does not behave in the same way. It displays disconnected bursts of sound. Consequently, instead of a continuous flow (as observed in the human language spectrogram representation), it appears more like a sequence of distinct pulses.

2.2.3. Written language

The written Heptapod language was designed for the movie by Martine Bertrand and Patrice Vermette. It was Martine Bertrand who was in charge of sketching the designs. After creating a set of fifteen designs, the design team started to come up with definitions for them, and each character was divided into twelve different parts in order through Wolfram Language, which is a proprietary programming language used also in the movie.¹⁷ The designs were also sent to Jessica Coon. She was asked to analyse and annotate each character. A dictionary of approximately one hundred symbols was created and used partially in the movie. (Coon, 2020: 41)



Image 3. An example of *Ensō*.¹⁸

Zen Buddhism. It represents absolute enlightenment and is created by two unrestrained brushstrokes. Not necessarily circular, this structure is also observed in some logographic writing systems, such as Japanese Kanji, where graphemes represent words. As Coon (2018:

2.2.3.1. Orthography

The symbols that appeared in the movie as the written language of the heptapods are classified as *semasiograms* by Ian Donnelly in the movie (minutes 00.54.25–00.54.30). Their form follows a single continuous and circular line. In a sense, they resemble the Japanese calligraphy *Ensō* (Image 3), a sacred, minimalist circular symbol influenced by

¹⁷ Christopher Wolfram's semasiogram analysis through Wolfram Language: <https://www.youtube.com/watch?v=r8nTifClr0c>

¹⁸ Painted brush *Enso* Zen circle by Hosoi Katsudo.

21) explains, “There is no clear beginning or end to the logograms, and the smoky blobs appear all at once.” In the novella, as well as in the movie (minutes 00.54.25–00.54.30), the written language of heptapods is described as *semasiographic* in nature; their meaning doesn’t have a direct connection to phonetic utterances. This nature makes them fit what is called *semasiograms*, which is a writing that does not represent sound but still carries a meaning. In the novella, Louise explains them as:

“Linguists describe writing like this-” I indicated the printed words “-as ‘glottographic,’ because it represents speech. Every human-written language is in this category. However, this symbol-” I indicated the circle and diagonal line “-is ‘semasiographic’ writing, because it conveys meaning without reference to speech. There’s no correspondence between its components and any particular sounds.” (Chiang, 2002:108).

However, the public discourse seems to opt for the term *logogram*. Louise elucidates how the label logogram is rather a misfit for these symbols:

In the next report I submitted, I suggested that the term “logogram” was a misnomer because it implied that each graph represented a spoken word, when in fact the graphs didn’t correspond to our notion of spoken words at all. [...] I suggested the term “semaqram” instead. It appeared that a semaqram corresponded roughly to a written word in human languages: it was meaningful on its own, and in combination with other semaqrames could form endless statements (Chiang, 2002:111).

The same semasiogram can be interpreted without knowing pronunciation, since understanding depends on recognizing the overall structure of the symbol rather than reading it aloud. For one thing, the circular, non-linear orthographic nature suggests that the heptapods need to know the structure of the entire sentence beforehand to form them (Nolletto & Lopes, 2020: 4; Heisser, 2015: 65).

Patrice Vermette, the production designer who helped designing the written Heptapod language, explains that if certain new elements are added to an existing semasiogram, such as a curl, it can change the meaning to that of a question or hesitation.¹⁹ For example, Image 4 and Image 5 represent the words *Louise* and *weapon*, respectively. However, Image 6, which stands for *Louise has weapon* is not a pure combination of these two semasiograms, but has an additional bulge, which can be interpreted as the auxiliary *has*. Another instance is observed through the addition of a hook as a question mark. Image 7 stands for *human*, whereas Image 8 stands for the interrogative *human?*. However, these additions appear to be haphazard and don’t follow a set rule.

¹⁹ Clark, K. (Director). (2017). *Xenolinguistics: Understanding “Arrival”* [Documentary]. Paramount Pictures.



Image 4.²⁰



Image 5.



Image 6. (Pointer of my own.)

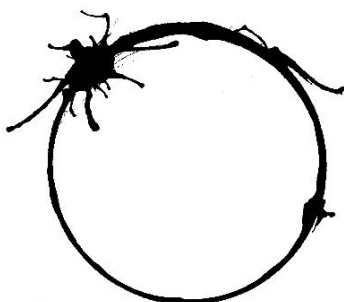


Image 7.



Image 8. (Pointer of my own.)

2.2.3.2. Syntax and lexicon

Written language governs a *visual syntax* rather than the regular syntax present in human languages (Noletto, 2018; Noletto & Lopes, 2021; Chiang, 2002). In a visual syntax, meaning is structured and organized through visual elements rather than through linear verbal sequences. Instead of relying on word order, visual syntax employs spatial relationships of position, proportion as well as simultaneity within a visual field. In the case of the written language, semasiograms appear as complete circular forms and emerge all at once, non-sequentially, a feature that contrasts strictly with humans' sequential construction of semantics. It is still possible to create meaning in semasiograms by merging one unit with another within the same circle. However, the meanings of semasiograms are not determined by sequencing but by the semasiogram's holistic spatial organization, which brings about a semantic holism. This feature

²⁰ Single semasiograms taken from <https://github.com/WolframResearch/Arrival-Movie-Live-Coding/tree/master/ScriptLogoJpegs> (Last accessed 15.01.2026)



is portrayed in the movie when Louise points out that the different regions of a semasiogram carry different informational weight, and notes that some segments are busier than others. The variation in ink density and thickness indicates that semantic distinctions are encoded visually within the spatial structure of the semasiogram rather than through ordered units comparable to words or morphemes. Meaning in written language, thus, emerges from the simultaneous perception of the whole form and the relative prominence of its internal segments.

Image 9. Semasiograms of the written Heptapod language.²¹

It can also be deduced from the translations of Heptapod semasiograms through the movie that the Heptapod language does not employ any past or future tense. This can be observed most clearly when Costello communicates with Louise to tell her that Abbott is dead. However, instead of saying Abbott died, Costello creates the semasiogram representing the sentence “*Abbott is death process*” (Image 10. Minutes 01.29.07–01.29.23), and “*In three thousand years, we need humanity help*” (Image 11. Minutes 01.30.25–01.30.45) instead of “*we will need*” when Louise asks their purpose on Earth. Although it is not possible to talk about a lexicon for the Heptapod languages in the manner of human languages, the movie presents an array of recurring semasiograms and their translations. Several semasiograms are explicitly glossed through on-screen subtitles and dialogue, such as symbols corresponding to concepts

²¹ Taken from the artist’s Instagram account <https://www.instagram.com/nabakumovart>

like *time* (Image 12), and *technology* (Image 13). These examples do not constitute a lexicon in the strict linguistic sense, but they do demonstrate that individual semasiograms function as stable semantic units whose meanings are inferred through repeated contextual use and visual analysis. We can also point out the fact that, as discussed in 2.2.3, the haphazard nature of semasiograms creates the problem of *polysemy*, which stems from their holistic visual syntax. For instance, the semasiogram for the *system* is represented in Image 13. Considering the density of ink, most likely, it does not stand for a single system, but all the possible systems that one can think of. It can encompass the educational system, the solar system, the bureaucratic system, the security system, the health system, so on and so forth. This semantic layering is also displayed in the movie when Louise and Ian were trying to decipher a semasiogram, and the possible meaning set was displayed on Ian's computer (Image 15. Minute 01.12.13 in the movie). After all, it was the ambiguous nature of the Heptapod language that caused the misinterpretation of the sentence *offer weapon*, it was only later understood that the weapon was their language. Louise drew specific attention to this feature also shared in human languages when she was discussing with the military about the meaning of *offer weapon*. She explains, "We don't know if they understand the difference between a weapon and a tool. Our language, like our culture, is messy, and sometimes, one can be both" (Minutes 01:07:07–01:01:17, Heiser, 2015: 50). She portrays the meaning as negotiated rather than fixed (Kusumastuti, 2019).

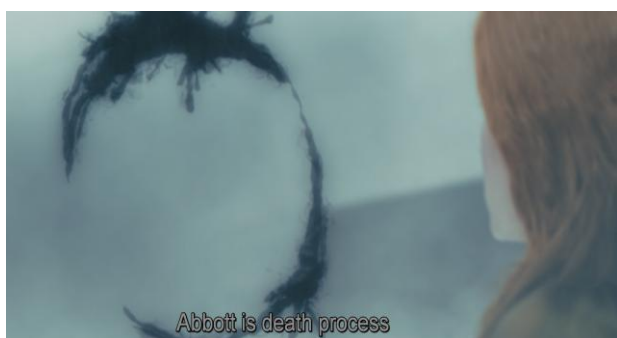


Image 10.



Image 11.



Image 12.



Image 13.



Image 14.

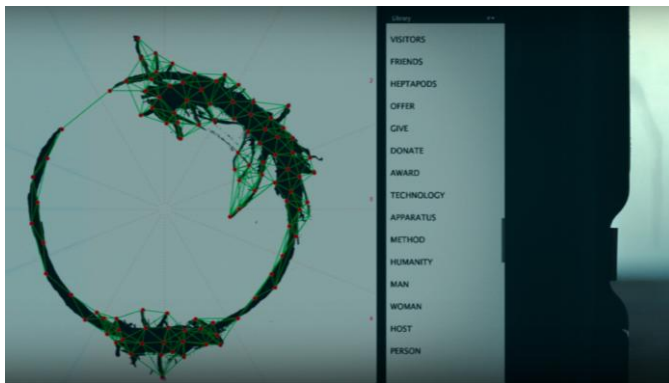


Image 15.

2.3. Presentation of the Sapir-Whorf hypothesis in *Arrival*

Arrival (2016) adopts a deterministic interpretation of the relationship between language and thought; therefore, it presents the strong version of the Sapir-Whorf hypothesis, despite its speculations. Louise's change is shown clearly through the movie as she learns the written Heptapod language, which has a non-linear orthography that allows heptapods to experience time cyclically. The circular nature of the heptapods' writing also reflects the way heptapods see and experience time, which is a reference to the Sapir-Whorf hypothesis (Noletto, 2018: 29). The message is explicit: different languages lead to different ways of thinking and perceiving the world. In the case of Louise, the non-linear orthography of the Heptapod language caused her to experience time in a non-linear manner rather than linearly as humans do. At this point, it is possible to mention an extension of linguistic relativity called the *script relativity hypothesis*. Script relativity, a recent hypothesis proposed by Hye K. Pae (2020, 2022), explains the effects of cross-scriptal reading experiences. Pae (2022: 1315–1316) notes:

[...] the features of a specific written form such as letter shape, letter/graph configuration (Roman letters vs. Non-Roman graphs), syllable (or character) formation (linearity vs. block), diacritics or circumflexes (marks used above or below a letter to indicate

contraction, accent, pitch, tone, or length), word constituents (simple or compound words), spatial relations (the degree of crowdedness within a character), and syllabic format (horizontality or verticality as particularly shown in Korean Hangul and some Chinese characters), yield considerable effects on mental processes, such as thinking (action of reasoning), thought patterns (product of thinking), recognition, conception, inference, and worldview.

Evidence from experiments supports Pae's approach. For instance, McBride *et al.* (2011) assessed 190 kindergartners from Hong Kong, (Chinese script), Korea (Hangul script), which are logography-based, Israel (Hebrew script), and Spain (Spanish script), which are alphabetic²², through Gardner's (1996)²³ standardized Visual Spatial Relationships task²⁴ to test whether different orthographies impact children's cognitive abilities, specifically visuo-spatial skills. The results revealed that children learning to read and write Chinese and Korean significantly outperformed those learning to read and write Spanish and Hebrew on the visuo-spatial task. There were no significant differences between the Hong Kong and Korean groups or between the Spanish and Israeli groups, as expected. The results indicate that having a complex script in terms of visuality enhances children's visual skills (Chang & Perfetti, 2018). More interestingly, Friedrich and Elias (2016) showed that native writing direction, from left-to-right as in English or from right-to-left as in Arabic, has an impact on aesthetic preferences. In their study, native speakers of Hindi (written left-to-right) and Urdu (written right-to-left) were exposed to different stimuli containing mirror-imaged picture pairs of objects and landscapes. The speakers' preferences were tested and compared through forced-choice decisions and stimuli (video loops, screenshots). Results showed that while Hindi speakers showed an aesthetic preference towards stimuli with left-to-right directionality (from the point of view of the perceiver), Urdu speakers did not show any sort of preference pattern towards either stimulus, which reflects the innate right-hemisphere dominance responsible for the left visual field.

²² The Hebrew writing system is also classified as an abjad, where only consonants are represented in a script. See <https://www.w3.org/International/hlreq/hebr/> for further information.

²³ Gardner, M. F. (1996). *Test of visual-perceptual skills revised*. New York: Psychological and Educational Publications.

²⁴ Gardner's test of visual-perceptual skills is an individually administered norm-referenced test that measures discrete visual-perceptual abilities without requiring motor output. The style of the test is multiple-choice, and in each item, the individual looks at a target stimulus printed on a page and must select the correct answer from several visually similar alternatives. The test consists of four levels: visual figure-ground, visual discrimination, visual closure, and visual memory. It can be administered to individuals between ages 5 and 21 (Martin, 2017). It is applied in educational and clinical contexts to support the assessment of learning difficulties, particularly in reading and writing. The test yields standard scores for each subtest as well as composite scores and thus allows for the identification of specific perceptual strengths and weaknesses.

Following Pae's proposal, it is possible to find nuances of script relativity in written Heptapod language that may have warped Louise's time perception. The circularity and lack of a linear sequence of the written Heptapod language provide the physical mechanism for this warp. While human writing systems are almost universally "glottographic", so they are bound by the sequential nature of speech, the written Heptapod language, on the other hand, given its semasiographic nature, conveys complex propositions all at once. This disrupts Louise's linear processing inherent in human scripts, which habitually map time from left-to-right or right-to-left. Instead, because a semasiogram has "no clear beginning or end", it demands her to have a conception of the entire structure of a sentence beforehand. It is this demand from a sequential process to a simultaneous one that shifts Louise's habitual cognitive orientation, as we, humans, perceive time in a linear order: the past predates the future, and the future follows the present. However, as discussed, events are not sequentially discovered in the Heptapod language. The heptapod writing system conveys meaning through complex semasiograms that encode entire propositions simultaneously rather than sequentially. Consequently, as Louise internalizes written Heptapod language, she also establishes a cyclical perception of time and begins having scattered premonitions of her future and unborn daughter. As discussed in 2.2.4, the written Heptapod language lacks past and future tenses, which reflects a worldview in which temporal distinctions are not encoded as sequential stages. Heptapod written language does not organize experience along a before-and-after axis either; rather, it treats events as coexisting within a single, unified structure that is a semasiogram. Within the movie's logic, this absence of tense is not only a linguistic feature, but a cognitive one as well. Steiner (1975: 132) suggests that for humans, "The past-present-future axis is a feature of grammar which runs through our experience of self and of being like a palpable backbone." By removing this "backbone", the Heptapod language does not require its speakers to distinguish between past, present, and future time; accordingly, temporal ordering ceases to be a fundamental organizing principle of experience. Furthermore, Steiner (1975: 132) questions whether the past has existence outside grammar and concludes that its "resurrection is verbal". In the Heptapod linguistic system, where such verbal resurrection is absent, events are not re-called from a distance but remain present (such as in *Abbott is in death process*). As a result, learning the written Heptapod language resulted in Louise's adopting a mode of cognition in which events are apprehended holistically rather than linearly.

Crucially, *Arrival* presents the consequences of this linguistic restructuring as deterministic rather than metaphorical. Louise's visions are framed as memories of events that have not yet occurred from a usual linear human perspective. In this sense, the strong version

of the Sapir-Whorf hypothesis is represented in the movie: language determines the range and structure of possible thought, and in doing so, reshapes the speaker's experience of time itself (Noletto, 2018: 56). During one of their conversations, Ian asks Louise whether she dreams in Heptapod language. At that moment, we observe a clear reference to the Sapir-Whorf hypothesis (Heiser, 2015: 72 (Minutes 01.01.55–01.02.23 in the movie)).

Ian Donnelly: You know, I was doing some reading about this idea that if you immerse yourself into a foreign language that it can actually rewire your brain -

Loise Banks: Yeah, the Sapir-Whorf hypothesis. It's the theory that the language you speak determines how you think, and [...]

Ian Donnelly: Yeah, it affects how you see everything.

It is also compelling to observe that the very first moment Louise and Ian were able to communicate with heptapods, that is when the heptapods created a semasiogram in response to Louise's *human* sign, the soundtrack chosen to play at the scene is called Sapir-Whorf²⁵, composed by Jóhann Jóhannsson (starting at minute 00.38.15). This choice can be read as a deliberate and well-thought-out reference to the Sapir-Whorf hypothesis's central suggestion that the language we speak fundamentally shapes the way we think. Nevertheless, in human contexts, perception is not radically changed by learning a second language or even becoming highly proficient in another language. In contrast, the written Heptapod language is presented as a language whose acquisition ensures a non-linear temporal perception and therefore, foreknowledge of the future (Noletto & Lopes, 2019). This represents a crucial departure from human linguistic experience and supports the movie's commitment to a strong, deterministic interpretation of the Sapir-Whorf hypothesis.

This deterministic linguistic perspective also introduces a profound philosophical paradox. If a person possesses absolute and specific knowledge of the future, can free will truly exist? As Louise observes in the novella, exact foreknowledge appears to be inherently incompatible with volition (Chiang, 2002: 132). Noletto and Lopes (2019) further develop this paradox through Chiang's intertextual reference to the *Book of Ages*, a hypothetical chronicle in which every past, present, and future event is already recorded. If an individual were granted access to such a book and attempted to act against what is written, the text would be rendered incorrect or merely probabilistic rather than certain; yet the premise of the Book of Ages presupposes access to the actual future, not a possible one. Within this framework, Louise's actions do not alter the timeline but merely constitute part of the chain of events that already

²⁵ Access the soundtrack at: https://youtu.be/CRHa-PMiMuM?si=rNT0_2_w8_X6kvYK

culminate in their known outcomes (Noletto & Lopes, 2019). Consequently, Louise's acquisition of the written Heptapod language does not simply grant her a new *tool* for communication; it necessitates a transition from a sequential experience of choice to a simultaneous experience. In our normal human experience of time, we act on cause and effect: I want to obtain reliable data, so I control the variables of the experiment. This is sequential; the choice builds the future. In contrast, the heptapods do not experience events as arising from prior causes that generate future outcomes. Rather, their cognition runs *teleologically*, that is, actions are undertaken with awareness of their eventual consequences, which are already integrated into the present moment (Noletto, 2020: 215). Thus, events do not unfold linearly but exist simultaneously as parts of a completed temporal whole.

In the novella, the nature of Heptapod language is referred to as *performative*, rather than *informative*. Louise observes that the Heptapod language does more than just to utter a sentence, but performs, in a sense, *actualizes* the reality (Chiang, 2002: 138). This characterization of the Heptapod language is a reference to be situated within J. L. Austin's speech act theory (1962)²⁶ According to Austin, utterances are basically divided into two categories: Constative/Informative and Performative, where the former simply gives factual information, and the latter performs the action itself. In sentence a, the act of apologizing is fulfilled, whereas in sentence b, the act is merely described.

- a) I apologize to Mrs. Manor and all others whose sensitivities were offended [...]
- b) Mike Royko apologized to Mrs. Manor (Birner, 2013: 177).

This observation of a performative nature stems from the heptapods' ability to experience past, present, and future at the same time holistically. Surely, the heptapods can bear the knowledge of what one might say; however, the sentence needs to be uttered to become real (Noletto & Lopes, 2020). Once Louise learns how to write like the heptapods, she begins to view time as they do. In their view, events don't happen because of a prior cause; they happen to fulfill a purpose that is already part of the timeline. Abbott, for example, owing to its ability to foreknow future events, knew that it was going to die on the ship. Nevertheless, it still joined the journey and didn't attempt to do anything to avoid its death. Similarly, in Louise's case, she doesn't take any actions to change her future, even though she could. In the end, she is bound by the obligation to fulfil the events as they are already known to occur, since knowledge of the future produces not freedom but necessity. Louise acts not because she chooses among alternatives,

²⁶ Lectures delivered by Austin on speech acts in 1955 were published later on in 1962.

but because she already knows what she will do, and her choice becomes retrospective rather than prospective (Noletto & Lopes, 2019: 96–97).

This also brings us to Pierre de Fermat’s basic principle of *least time*. Although it is not described explicitly in the movie, in contrast to the novella, the implications of the least time principle are observed clearly in heptapod’s temporal perception. Fermat’s principle suggests that light will choose the fastest path travelling in water and presupposes knowledge of both the point of origin and the point of arrival, since the determination of the fastest path is only possible once the outcome is already fixed (McDonough, 2022). In the novella, this phenomenon is explained through the path a light takes (Image 16). Unlike human perception, which relies on causal physics, where an event at point A causes a subsequent event at point B, Fermat’s principle describes light behaviour in a way that requires the endpoint to be known from the beginning. For a ray of light to choose the path that takes the least time, it must, in a sense, *calculate* its entire journey and destination before it starts moving. Similarly, as discussed, heptapods don’t interpret reality through efficient causes and sequential progression, but they understand events in terms of purpose, destination, and total configuration, which requires their cyclical temporal perception. In this sense, heptapods’ temporal awareness mirrors an eternalist or *block-universe* model, proposed by metaphysician John McTaggart Ellis, where past, present, and future coexist simultaneously and the passage of time is a construct of human cognition, simply an illusion (Noletto & Lopes, 2018: 212–217).

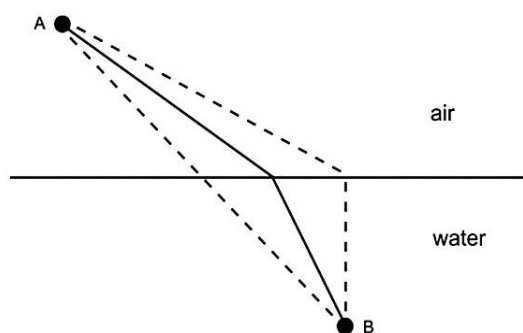


Image 16. Ian Donnelly’s third drawing in *Story of Your Life* to visualize Fermat’s principle of least time (Chiang, 2002: 117).

2.4. Language and temporal perception

The idea of perceiving time differently is, certainly, not a new notion. Research on language and temporal perception has consistently shown that human cognition relies on structured mental models to represent time. Nevertheless, it was also observed that mental

representations of time pose changes from one language to another, as well as from one culture to another (Boroditsky, 2011). Humans' temporal perception is observed to differ in different domains of experience. We as humans conceptualize and represent time through:

1. The spatiotemporal metaphors
2. Writing directions
3. Absolute space

To test the influence of language on time representation, several scholars have conducted experiments on speakers of different languages. **(1)** Mandarin speakers are known to use vertical metaphors, such as using *shàng* 'up' for describing earlier events and *xià* 'down' for later events. Boroditsky (2001) compared how English and Mandarin speakers conceive of time. In her experiment, images of objects arranged either horizontally or vertically (spatial primes) were followed by questions about time to see if the orientation of the images affected reaction speeds. English speakers, who primarily use horizontal metaphors (e.g., "ahead" or "behind"), were faster to answer after seeing horizontal primes, while Mandarin speakers, who frequently use vertical metaphors, were faster after seeing vertical primes, even when the test was conducted in English. **(2)** Some languages arrange their writing from left to right (e.g, Spanish, German), some from right to left (e.g, Hebrew and Arabic). When speakers of different writing directions were given a picture-arranging task where they needed to organize pictures in chronological order, it was observed that people who write from left to right arrange the timeline of the pictures from left to right, with the reverse pattern observed for right-to-left writers (Fuhrman & Boroditsky, 2010; Tversky *et al*, 1991). **(3)** Some aboriginal communities are noted to use absolute direction terms, such as East and West, in contrast to spatial terms like right and left. One instance is the Australian Aboriginal language Kuuk Thaayorre. Boroditsky and Gaby (2010) asked the speakers to arrange pictures showing temporal progression, like aging. Boroditsky (2011: 338) explains:

The Kuuk Thaayorre did not arrange the cards more often from left to right than from right to left nor more toward or away from the body. However, their arrangements were not random: [...] Instead of arranging time from left to right, they arranged it from east to west that is when they were seated facing south the cards went left to right when they faced north the cards went from right to left when they faced east the cards came toward the body and so on this was true even though we never told any of our subjects which direction they faced the kuuk thaayorre not only knew that already but they also spontaneously used this spatial orientation to construct their representations of time.

The diversity in how people of different languages and cultures map time suggests that temporal perception is not a universal biological constant, but rather a cognitively flexible construct shaped by linguistic and cultural scaffolding. As Steiner (1975: 131) asserts:

The ‘strong’ sense of the time-language relation is grammatical. It is no Whorfian fantasy to say that our uses of time are mainly generated by the grammar of the verb [...] different cultures operate with and within different conceptualizations or, at least, different images of time.

Consequently, the mental architecture we use to process the abstract concept of time would be intrinsically tied to habits reinforced by our culture and native tongues.

Another domain where language was observed to influence the temporal perception is the duration of events. Casasanto *et al.* (2004) investigated whether linguistic differences in how speakers metaphorically describe time influence their non-linguistic mental representations of duration. The experiment compared speakers of English and Indonesian, who primarily use distance-based metaphors (e.g., a “long” time), with speakers of Greek and Spanish, who tend to use quantity-based metaphors (e.g., Greek *poli ora* ‘much time’). Participants performed time-estimation tasks while viewing interfering visual stimuli that varied in either spatial distance (a line growing across a screen) or volume (a container filling with liquid). At the end, English and Indonesian speakers’ time estimates were significantly interfered with by the distance the line grew, whereas Greek and Spanish speakers’ estimates were more affected by the amount of liquid in the container. Bylund and Athanasopoulos (2017) used the same experimental paradigm to test how linguistic metaphors for time, specifically distance-based (e.g., “long time” in Swedish) versus amount-based (e.g., “much time” in Spanish), influence mental representations of duration in bilingual individuals. Through a series of psychophysical experiments, researchers found that monolingual Swedish speakers’ time estimates were misled by the spatial length of a growing line, while Spanish speakers were interfered with by the size or quantity of liquid filling a container, which is a direct reflection of the preferred metaphors in their respective languages. Crucially, the study demonstrated that Swedish-Spanish bilinguals shifted their time perception depending on the language context of the task and showed increased distance interference when prompted in Swedish and increased amount interference when prompted in Spanish. These language-specific effects were most pronounced during difficult discriminations and disappeared when linguistic cues were removed.

In light of these findings, it can be concluded that natural languages influence temporal cognition in domain-specific and attentional ways rather than through full cognitive determination. Cross-linguistic evidence suggests that the representation of time in the human

mind is affected by the specific metaphors prioritized by a speaker's grammar. Speakers may habitually privilege certain spatial metaphors or temporal orientations within their native languages, but they do not reconstruct these domains in a literal sense. Therefore, *Arrival* stands as a radicalized representation of these experimentally observed tendencies and transforms subtle linguistic biases into a cognitive determinism. Whereas real-world languages merely guide attention toward particular dimensions of experience, the written Heptapod language is portrayed as restructuring temporal perception altogether.

3. Avatar and the ecological world

3.1. Narrative context of Avatar

Shot in 2009 for the first time by James Cameron, *Avatar* is a movie series consisting of three movies as of 2026: *Avatar* (2006), *Avatar 2: The Way of Water* (2022), and *Avatar 3: Fire and Ash* (2025). For this study, only *Avatar* (2006), and *Avatar 2: The Way of Water* (2022) will be examined due to their relation to the thesis subject. The series is planned to continue until *Avatar 4* and *Avatar 5*, to be released in 2029 and 2031, respectively. All three films are distributed by 20th Century Fox and have reached an average rating of 7.5 on IMDb. Lead roles include Sam Worthington as the protagonist paraplegic former Marine Jake Sully, Zoe Saldana as princess Neytiri te Tskaha Mo'at'ite, Stephen Lang as the head of the mining operation's security Colonel Miles Quaritch, Sigourney Weaver as the Avatar Program head Dr. Grace Augustine, and Giovanni Ribisi as Resources Development Administration (RDA) head Parker Selfridge.

Avatar movies take place in distant future, on the fictional extraterrestrial moon Pandora located in the Alpha Centauri star system. Pandora shares several fundamental physical characteristics with Earth. The resemblance is most evident in the presence of continents, oceans, and wildlife. Also, it is habitable and has rather similar gravity to Earth. However promising it appears, humans are not able to breathe on Pandora without the help of an oxygen mask called *Exopack* since the nitrogen-oxygen level is twenty percent denser than that of Earth's. The indigenous local people of the moon are hunter-gatherer creatures named *Na'vi*. The *Na'vi* people are portrayed as individuals averaging around three meters in height, characterized by cyan-coloured skin, long tails, feline ears, and almond-shaped eyes. The *Na'vi* use their braids to connect with nature, animals, and their goddess *Eywa* (Wilhelm & Mathison, 2009: 3–29). The *Na'vi* people speak the *Na'vi* language, which is categorised as an agglutinative language, such as Turkish (Suprycheva, 2022: 37). To explore Pandora and

gain the trust of the native Na'vi, humans utilize cloned humanoid Na'vi bodies called *Avatars*, which are used and controlled from the brain of a remotely located human.

Throughout the series, due to the resource insufficiency in the world, Pandora is attacked by humans, referred to as *sky people* by the Na'vi, to mine the hypothetical high-value mineral called unobtainium, which is formed volcanically and used for energy transmission. "This is why we're here. *Unobtainium*. Because this little grey rock sells for 20 million a kilo. That's the only reason. It's what pays for the whole party. It's what pays for your science" (Minutes 00.17.30–00.17.40 in *Avatar* (2009), Parker Selfridge to Dr. Grace Augustine).

The first movie commences with Jake Sully's narrative about the sequence of events leading to his taking over the contract of his recently dead brother. Jake is recruited by the RDA to replace his dead identical twin in the Avatar mission. However, Jake wasn't welcomed initially by the head of the Avatar program, Dr. Augustine, since he is paraplegic and, unlike his dead brother, who had trained for three years for the mission, has no significant knowledge about working in the lab, the Na'vi, and the moon Pandora. Colonel Miles Quaritch, however, guarantees Jake the restoration of his legs' mobility in exchange for leaking information about the Na'vi, to which Jake agrees. Through the program, Jake controls an Avatar body that allows him to move freely on Pandora, in contrast to his life on Earth, and becomes highly attached to his Avatar body. During one of his early missions, Jake becomes separated from the group because of an attack by the wildlife and is later saved by Neytiri. Even though Neytiri was very suspicious of Jake at first, when he was surrounded by the seeds of the Sacred Tree, she was convinced of Jake's purity and brought him to her clan, *Omaticaya*. When Neytiri's mother, the spiritual leader of the clan, acknowledged Jake's arrival as the will of Eywa, she commanded Neytiri to train Jake to fit into the Na'vi society since he was almost incapable of surviving on Pandora. As Jake started learning the Na'vi customs, he was simultaneously pressured by the Colonel to locate the sacred Hometree because of its position above a major deposit of unobtainium. Consequently, Jake's role as a spy placed him in a position of moral conflict as he grew highly attached to the Na'vi and developed a romantic relationship with Neytiri. The two eventually chose each other as partners, and Jake integrated even deeper into the Na'vi community. Sideris (2011: 466) explains: "His (Jake) moral progress was marked by particular rites of passage, as he was inducted into the Na'vi community, as well as moments of empathic bonding with other creatures and, especially, with Neytiri."

Predictably, the continuation of the mining was a threat to the long existence of the Na'vi on Pandora. Despite Dr. Grace's repeated warnings not to harm the Hometree, as it stands as a crucial node in Pandora's biological neural network, Selfridge authorizes its destruction to scare

the Na'vi people, and the situation takes an even more serious turn when Jake attempts to stop humans from destroying it. Before the destruction, Selfridge allocates Jake and Grace a short time to convince the Na'vi to evacuate the site, during which Jake admits that he has been spying on them. Jake's confession results in his and Grace's captivity, and shortly afterwards, Hometree was destroyed, which gave rise to heavy casualties, including the death of Neytiri's father, who was the chief of the clan. Although Jake and Grace were eventually freed, they were captured by Quaritch's forces shortly after being disconnected from their avatars. Nevertheless, with the help of a pilot who was disturbed by Quaritch's cruelty, they managed to escape to Grace's outpost. In the meantime, in an effort to regain the Na'vi's trust, Jake bonds with the *Toruk*, a powerful and respected creature in the Na'vi society, and returns to the clans as a leader. He calls on all Na'vi to resist the human forces and gains the people's trust by planning to fight against his own species. During the battle, many are killed, but the Na'vi are ultimately saved when Pandora's wildlife joins the fight, which Neytiri saw as Eywa's interference and recognition of Jake. In the final fight, Quaritch attempts to kill Jake by disconnecting his human body from his Avatar, but eventually, Neytiri kills Quaritch and rescues Jake. After the defeat of the RDA, the humans are expelled from Pandora, with only a few permitted to remain. Soon after, Jake decides to undergo a permanent transfer from his human body into his avatar body through a ritual at the Tree of Souls. As a result of his transformation, Jake's place was affirmed among the Na'vi people. The first movie ends with Jake waking up and opening his eyes to his new home in his new body.

The second movie, *The Way of Water* (2022), narrates the post-battle with the RDA and Jake's new life as the chief of the Omaticaya clan. After his death, Colonel Quaritch is also transformed into an avatar body to defeat the Na'vi from inside, in their way, and with their strength. Jake and his family were living a peaceful life with their children until RDA returned to Pandora and destroyed the settlements severely. Upon the attack and captivity of his children, Jake realizes that it is no longer safe to live in Omaticaya village and decides to flee to the *Metkayina* clan with his family in the Pandoran ocean reefs. The Sully family is welcomed to the clan by the Metkayina chief Tonowari. Nevertheless, the rest of the clan did not show the same hospitality at first since the Sullys were outlanders and, according to them, possessed demon-blood due to Jake's and some of his adopted children's human origin. However, the community eventually welcomed them upon the command of Tonowari. Soon after they were settled, one of Jake's sons, Lo'ak, was tempted by the sons of Tonowari to go further into the ocean, where he became subject to a shark attack and was eventually rescued by Payakan, a member of a highly intelligent whale-like species, *Tulkun*. As a result of this incident, Lo'ak

bonds with Payakan and learns that he has been outcasted from his clan due to the fact that it killed, which is against the Tulkun moral values. In the meantime, Quaritch joins the Tulkun hunters who hunt the Tulkun species to obtain a substance called *Amrita* from their bodies that halts human aging and sells for as much as eighty million dollars per vial. As Quaritch expands the killings of the Tulkuns and tortures the Na'vi people to reveal the location of Jake, he hopes that Jake will expose himself to stop the murders. Even though the Metkayina people were aware of the Tulkun hunting before the recent attacks, they sensed a great danger to their people and village, as this time it was within their territories. Lo'ak was the first to have set off to warn Payakan about the danger. He was followed by his siblings and the children of Tonowari. Soon after, Lo'ak, his brother, and Tonowari's daughter were captured by Quaritch. Once they found out that their children face peril, Neytiri, Jake, and the other Metkayina people set out to confront the humans. Meanwhile, Quaritch forces Jake to surrender in exchange for the children, but Payakan attacks Quaritch's ship before Jake and triggers a fight that kills most of the crew and causes the ship to sink. As the ship continues to sink, Jake confronts Quaritch in a final struggle. During their fight on the flooding ship, Jake ultimately overpowers Quaritch and nearly strangles him to death. However, because of the damage from the fight, Jake was left weak and nearly drowned before Lo'ak and Payakan helped him out of the wreckage to reunite with his family. Even though the battle was a victory for the Na'vi, it resulted in one of Jake's sons' deaths, as well as many other Metkayina people. Consequently, in order not to bring further harm to the Metkayina people, Jake shares his decision with Tonowari to depart after the funeral of his son. Tonowari, however, assures Jake that they are a part of Metkayina now that their son lies with their ancestors. Accepting this gesture of hospitality, Jake and his family join the sea people. During his connection with the Metkayina's spiritual tree, where he meets his dead son, Jake realizes that he needs to stand by and fight for his people. The movie ends with Jake's opening his eyes once more, but this time, *seeing* as well.

In one of his interviews²⁷, Cameron explains that the *Avatar* movies are meant to reflect humans' derogatory relationship with nature, how we don't respect it, and don't learn from our mistakes, which would eventually lead us to our own destruction.

3.2. Na'vi culture

Na'vi translates as *the people*, and the culture of these people is particularly renowned for its interconnected and symbiotic relationship with nature and other creatures living on Pandora

²⁷ Access the interview at: https://www.youtube.com/watch?v=Q54rUHXgc_w (Last accessed 15.03.2026)

(Wilhelm & Mathison, 2009: 26). One great instance of this relationship is the importance of Hometree to Na'vi. Hometree, *Kelutral* in Na'vi, is both the spiritual and physical home of the Omatikaya clan, which is as tall as three hundred twenty-five meters. The Hometree is where the Na'vi perform rituals, sleep, eat, and gather. Clan members include Eytukan (Neytiri's father), the leader and the protector of the clan; Mo'at (Neytiri's mother) is the spiritual leader or *tsahik* who is responsible for conducting sacred rituals and interpreting the will of Eywa; and Shaman of Songs, an important figure as a storyteller who conducts rituals of singing about the will of Eywa and keeps the clan lore (Izzo, 2022: 70–71). The Na'vi opt for collective behaviour, as observed in their ceremonies and sleeping practices. Hometree is able to host dozens of Na'vi, and the clan members sleep with their mates or families in their hammocks located in the hometree. This preference allows the members to warn one another in a situation of danger and create physical comfort and closeness. Should a member sleep alone, it is understood that the member is in agony (Wilhelm & Mathison, 2009: 34–38). Nevertheless, the Hometree is not just a tree of its own; besides sitting upon a rich unobtainium deposit, it is a neural network surrounding Pandora through which Na'vi can access and upload data, such as their memories. Dr. Augustine explains Hometree's nature and why RDA shouldn't destroy it during the first movie "[...] there is some kind of electrochemical communication between the roots of the trees, like synapses between neurons. And each tree has ten-to-the-fourth connections to the trees around it. [...] It's more connections than the human brain. [...] It's a network. It's a global network, and the Na'vi can access it. They can upload and download data, memories" (Minutes 01.31.17–01.32.49 in *Avatar* (2009), Dr. Grace Augustine to Parker Selfridge). Similarly, before an important decision or action, the Na'vi visit the *Tree of Voices* to upload their thoughts and seek the response of Eywa (Izzo, 2022: 80). The Na'vi access their deity, Eywa or the Great Mother, also through a tree called *The Tree of Souls*. In his video log, Jake explains how Neytiri talks about *a network of energy* that flows through all living things and that all energy is only borrowed and one day you have to give it back (Minutes 01.04.01–01.04.20 in *Avatar* (2009)). This exchange of energy points to the reciprocity of relationships. Brown (2001: 86) explains:

Reciprocity refers to the process by which, if one receives or takes away, one must also give back. This is a living statement of the importance of the cycle that permeates all of life: the cycle of life and death, of life leading to old age and then coming back to life again. Black Elk so often said that all the forces of the world work in circles: the birds build their nests in circular form, the foxes have their (p.85) dens in circles, the wind in its greatest power moves in a circle, and life itself is a circle. Relationships also follow this circular pattern of reciprocity. In treating the world and all its beings in a sacred manner, one is in turn treated well by nature.

The kind of perception the Na'vi have of their goddess is also presented in a reciprocal relationship, within which the clan members are aware of the energy exchange and treat the nature around them accordingly. One can argue that Na'vi culture parallels shamanic traditions closely. For instance, the idea of the divinity of the trees and nature in general is a constantly recurring pattern in shamanistic traditions as well. In these traditions, nature is regarded as a spiritually alive site in which trees, animals, and landscapes (such as mountains) possess agency and spiritual significance (Pratt, 2007: 319). A remarkably striking resemblance can be observed between the sacred trees of the Na'vi and the ancient Turkic concept of the *Tree of Life*. According to ancient Turkic legends, the sacred Tree of Life sits in the middle of the Earth and serves as both a hypothetical and physical bridge and a means of communication between the mortal and divine world. Within the branches of the tree dwell the spirits of humans, and at its peak sits the God (Işık, 2004: 93). Following this belief, it was believed that when unified, the trees create the spirit of the whole forest (Çolak, 2026). Similarly, the sacred trees in Pandora also host souls and allow people to connect to their deity, as well as contributing to the forest's spiritual network. Additionally, the idea of a flow of energy is a common pattern in shamanic cultures (Langdon, 2013). In *Avatar*, Eywa, who controls this flow, is identified as a collective consciousness that stores the thoughts and feelings of every living thing (Wilhelm & Mathison, 2009). In the first movie, Neytiri interpreted the seeds of the sacred tree's approaching Jake as *Eywa's will*. Later in the movie, when she found Jake praying to her to help him in his fight with sky people, Neytiri explained, "Our great mother does not take sides, Jake. She protects only the balance of life" (Minutes 02.09.30–02.09.38 in *Avatar* (2009)). As can be deduced from Neytiri's explanations, Eywa is presented as a living being with will and decides on the turn of events in a way that will bring balance. As previously discussed, the Na'vi are in possession of a braid that allows them to connect with Eywa. At the Tree of Souls, the Na'vi, usually collectively, lock their braids to the divine branches of the tree and create a neural link between their mind and Eywa as well as their dead ancestors. Once connected, the Na'vi pray, seek help, or communicate with the souls of the dead. A comparable ritual logic appears in the Shamanic tradition of tying cloths to the trees. Ancient Shamanic-Turkic societies would circle the sacred trees as they performed a ritual of prayer and held funerals. When faced with an unfortunate situation, such as an illness, they would tie a piece of cloth, pray to God, and ask for salvation, as they believed the tree acted as a mediator between God and the ephemeral

world (Roux, 2022: 182)²⁸. The Na’vi don’t tie an external cloth, but they physically connect their own braids to the branches of the Tree of Souls when communicating with Eywa or their ancestors. Although the Na’vi connect to the trees through a biological neural link, both practices illustrate the idea of establishing contact and common ground with a spiritual power through direct physical interaction via a sacred tree. Throughout the movies, it can be observed effortlessly that Eywa, as a goddess figure, is not a power ruling outside the planet, but a power that is within and identical to Pandora. Just as suggested in Pantheistic theses, Eywa is a ubiquitous power that surrounds and encompasses the moon (Eberl, 2014: 21, Mikhelson, 2016: 94). The braids of Na’vi also allow them to bond with animals, most importantly, with *Ikrans*, which are four-winged mountain banshees highly adapted to flying. The ritual of bonding is called *Tsaheylu*, and it’s a prerequisite to bond with an Ikran to become an official Na’vi warrior. However, the bonding process includes taming and convincing the beast to physically bond through the braids of the Na’vi; therefore, it is a challenging, even a life-threatening process. Once connected, the Na’vi and the banshee are bonded for life (Wilhelm & Mathison, 2009: 61–63). In the end, each interaction between the Na’vi and nature is a reciprocal and symbiotic one that maintains ecological balance within the moon. This interaction and interconnectedness with nature necessitate developing a sense of empathy. Sideris (2010: 470) explains the development of empathy during the bonding ritual with Ikran as “[...] at the moment the connection is made, the camera zooms in on the dilated pupils and widened eyes of the bonded animal whose perception of the world is now attuned to its master’s. With this bonding, a kind of neural interface occurs between the Na’vi rider and his or her steed; the rider now feels what the animal feels and synchronizes perfectly with its movements and thoughts (though with the rider in control).” According to Sideris (2010), it is also possible to find an instance of a symbiotic relationship in Na’vi hunting practices. In the Na’vi society, the killing of an animal can only be performed through a ritual to honour the animal. When Jake hunts for the first time, he recites a prayer and thanks the animal while stabbing it. However, since he was not truly embedded in the Na’vi culture at that time, both his rushed killing and exclaiming “That’s right, you are mine” after a forced bonding with the Ikran reflect his background as an ex-marine and a total misunderstanding of the Na’vi perspective of becoming one with nature, as well as other living creatures, instead of dominating them (Sideris, 2010: 470–471). Lastly, it is noteworthy to mention that the Na’vi attributes great significance to their ceremonies. So far, we have mentioned the *Tsaheylu* ritual of bonding with an Ikran and collective ceremonies for

²⁸ Original work published in 1984 as *La religion des Turcs et des Mongols*.

connecting with ancestors and Eywa. Nevertheless, the Na'vi ceremonies are not limited to the already mentioned practices. One major ceremony is the consciousness transfer ritual. Through this ceremony, the soul and memories of one can be transferred from one body to another, such as Jake's transfer from his human body to an Avatar body, with the help (and will) of Eywa. In this ceremony, the body is explicitly tied to the Tree of Souls, and a ritual of singing and praying then happens.²⁹ Another ceremony performed under the Tree of Souls is the healing ceremony. The healing ceremony is performed through chanting and the use of herbs. An instance of this ceremony can be found in the first *Avatar* movie (2009) where Dr. Grace Augustine was laid down by the tree of souls and the clan's spiritual leader, along with other Na'vi, performed a series of chants over her body to save his life (Starting in 02.13.50 in *Avatar* (2009)). If, however, the healing ceremony doesn't prove to be successful and the subject dies, a funerary ritual follows. Since the Na'vi believe all energy must be returned one day, they perform a series of rituals of singing and chanting over the body to lead it to Eywa. Then, the body is buried among the roots of the tree of souls or the hometree, where it is believed to lie with Eywa, and a seed from the tree of souls is placed along with the corpse. At the end, the energy is returned to Eywa, and the life cycle is completed (Izzo, 2022: 65). The funeral of Jake and Neytiri's son in the second *Avatar* movie (2022) is an example of such a funerary ceremony (Minutes 02.58.48–02.03.00.30 in the movie). Another occasion where a ceremony needs to be performed is a pre-war situation. Before the wars, a pre-battle ritual dance is performed. This dance is accompanied by the *War Drum*, which helps to send warning signals. Each rhythm played on this drum represents a different kind of danger, and each Na'vi child is raised sensitive to these rhythms and signals (Wilhelm & Mathison, 2009: 46).

3.3. Na'vi linguistic system

In 2005, Paul Frommer created the Na'vi language for the upcoming 2009 *Avatar* movie upon the request of the director James Cameron. At the time, Cameron had already come up with approximately thirty words for the language and asked Frommer to keep up with these words in his design and develop a language that has a consistent phonology, morphology, syntax, and lexicon. The only thing the language lacks is a writing system.³⁰ Nevertheless, Frommer reports having created a Roman alphabet orthography for describing and transcribing the language to the actors.³¹ Frommer also explains that he created the language from scratch

²⁹ <https://avatarinitium.fandom.com/wiki/Eywa?utm> (Last accessed 17.03.2026)

³⁰ Related interview can be accessed at: <https://www.campfirewriting.com/learn/interview-paul-frommer> (Last accessed 23.07.2026)

³¹ <https://usoproject.blogspot.com/2009/11/interview-with-paul-frommer-alien.html> (Last accessed 17.03.2026)

and didn't base the language on any of the existing languages, nor did he obtain inspiration.³² Therefore, it is safe to classify the Na'vi language as an *a priori* language. Frommer also clarifies that while he aimed for the Na'vi to be accessible to speakers and actors, he also wished to make it a complex and unusual one that would take effort to analyse.³³ Most of the linguistic knowledge concerning the Na'vi language comes from the creator Paul Frommer's written and oral interviews. Additionally, the interview Frommer gave to the Language Log³⁴ provides a primary reading of the language. Frommer publishes new vocabulary and developments in Na'vi grammar in his blog³⁵, and all the other proposals for additions to the language must be approved by him to be accounted for within the official language. The biggest online Avatar fan community, Learn Na'vi, also presents a Na'vi dictionary series compiled in different languages, as well as other learning material and forum discussions.³⁶ In a 2020 interview, Frommer describes the Na'vi language as being intertwined with the culture of the Na'vi and the environment of Pandora.³⁷ In the second *Avatar* movie, *The Way of Water*, a new dialect of the Na'vi language was introduced, which is the reef dialect spoken by the Metkayina clan. The information about the dialect comes from Frommer's previously mentioned blog, where he posted the differences in phonology, morphology, syntax, as well as a vocabulary list and his speech at the OmatiCon (2023)³⁸, a virtual Avatar fan convention. Despite not having a set standard dialect, the language focus of this chapter will be set on the Na'vi dialect spoken by the Omatikaya clan, namely the forest people, in order to avoid possible confusion.

3.3.1. Phonology and morphology

3.3.1.1. Phonology

The Na'vi language has twenty consonants, seven vowels, four diphthongs, and two syllabic pseudovowels.³⁹ Unlike natural languages, Na'vi does not possess voiced stops /b/, /d/, nor the glide /j/ and the uvular stop /q/. One prominent feature of Na'vi is its frequent use of

³² Related interview can be accessed at: <https://usoproject.blogspot.com/2009/11/interview-with-paul-frommer-alien.html> (Last accessed 17.03.2026)

³³ Related explanation by Frommer can be found between minutes 17.22 and 21.35 in <https://youtu.be/sN0KMQIHLx0?si=odXO1uHqypj0S11L&t=1042>

³⁴ <https://language-log.ldc.upenn.edu/nll/?p=1977> (Last accessed 17.03.2026)

³⁵ <https://naviteri.org/> (Last accessed 17.03.2026)

³⁶ <https://learnnavi.org/media/> (Last accessed 17.03.2026)

³⁷ Related interview can be accessed at: <https://www.youtube.com/watch?v=sN0KMQIHLx0> (Last accessed 17.03.2026)

³⁸ Frommer's presentation on Na'vi Reef Dialect at OmatiCon 2023: https://www.youtube.com/watch?v=Rb_ZF9ZwzAM&list=WL&index=14 (Last accessed 17.03.2026)

³⁹ The term *pseudovowel* is a label used by the language's creator, Dr. Paul Frommer, to describe Na'vi's syllabic liquids; it is not a standard recognized term in linguistics.

ejectives. According to PHOIBLE⁴⁰ data analysed by Urban and Moran (2021), ejective consonants occur in approximately 8% of the 2,132 sampled languages but are represented across 65 out of 248 language families, which make up around 26% of the dataset. This suggests that while ejectives are typologically uncommon, they are geographically prevalent and tend to occur in high-altitude zones, though no causal relationship was found between altitude and the presence of ejectives (Urban & Moran, 2021). Additionally, the nasal *ng* [ŋ] can be observed in the onset position of a syllable (such as *ngawng* [ŋawŋ] ‘worm’⁴¹). According to WALS⁴², 147 out of 469 sampled languages permit the velar nasal in the initial position, while 87 allow it non initially, and the remaining 235 do not have it at all. Although the abovementioned phonological features are attested cross-linguistically, their combination in Na’vi adds to the language’s distinctive and phonetically *alien* sound.

				Velar	Glottal
Ejectives (Digraphs):	px /p’/	tx /t’/		kx /k’/	
Voiceless Stops:	p /p/	t /t/		k /k/	’
Affricate:		ts /ts/			
Voiceless fricatives:	f /f/	s /s/			h /h/
Voiced fricatives:	v /v/	z /z/			
Nasals:	m /m/	n /n/		ng /ŋ/	
Liquids:		r, l /r, l/			
Glides:	w /w/		y /y/		

Table 1. Na’vi consonants (Frommer, 2009).

Any consonant can appear at the beginning of a syllable; however, clusters of two consonants can appear in syllable-initial position only in the combinations of:

f, s, ts + {p, t, k, px, tx, kx, m, n, ng, r, l, w, y}

Consequently, while red-marked consonants can occur in syllable-initial position, blue-marked consonants can occur in syllable-final position (Frommer, 2009).

<i>i</i>	[i]
<i>ì</i>	[I]
<i>e</i>	[ɛ]
<i>ä</i>	[æ]

⁴⁰ Data sourced from Urban and Moran (2021) via the PHOIBLE database. The global distribution of languages with ejective consonants can be accessed at:

<https://journals.plos.org/plosone/article/figure?id=10.1371/journal.pone.0245522.g001> (Last accessed 18.05.2025)

⁴¹ Taken from: <https://learnnavi.org/navi-vocabulary/> (Last accessed 18.03.2026)

⁴² <https://wals.info/chapter/9> (Last accessed 19.05.2026)

<i>u</i>	[u] or [U]
<i>o</i>	[o]
<i>a</i>	[a]

Table 2. Na’vi vowels (Frommer, 2009).

<i>aw</i>	[aw]
<i>ew</i>	[ɛw]
<i>ay</i>	[aj]
<i>ey</i>	[ɛj]

Table 3. Na’vi diphthongs (Frommer, 2009).

<i>rr</i>	[r:]
<i>ll</i>	[l:]

Table 4. Na’vi pseudovowels (Annis, 2010–2024: 10).

Na’vi follows a (C)(C)V(C) syllabic structure, where C stands for a consonant and V either for a vowel or diphthong. Consequently, vowels or diphthongs can be directly preceded by one or two consonants and followed by another consonant in Na’vi syllables. However, a Na’vi syllable cannot end in two consonants. In a CV syllabic composition, a vowel can be replaced by liquids ([l] and [r]). If a prefix precedes an initial consonant, lenition occurs.

- Ejectives *px* /p’/, *tx* /t’/, *kx* /k’/ mutate to p, t, k, respectively.
e.g *txep* ‘fire’ > *mì tep*
- Voiceless stops p, t/ts, k mutate to f, s, h, respectively.
e.g *kelku* ‘home’ > *ro helku*⁴³
- In glottal stop “ ’ ” no change is observed.
- Following consonants do not comply with the lenition rule: f, s, h, v, z, m, n, ng, r, l, w, y (Frommer, 2009)
- Pseudovowels cannot occur in onset position of a syllable, they need to be preceded by a consonant.⁴⁴

⁴³ Examples taken from: <https://kelutral.org/horen/2-2> (Last accessed 18.03.2026)

⁴⁴ <https://kelutral.org/horen/2-1> (Last accessed 27.05.2026)

3.3.1.2. Morphology

Nouns and pronouns in Na’vi are subject to inflection for case and number, but not as frequently for gender. The following six cases are present for nouns and pronouns: Subjective (Intransitive), Agentive (Ergative), Patientive (Accusative), Genitive, Dative, and Topical. Case endings differ according to how a word ends, such as in a consonant, a vowel, or a diphthong.

	Vowel	Consonant&Pseudovowel	Diphthong
Subjective	—	—	—
Agentive	-l	-il	-il
Patientive	-t or ti	-it or -ti	-ti, -it, -ay-(i)t/- ay-ti, -ey-t(i)
Dative	-r, -ru	-ur, -’-ru -	-ru, -ur, -aw-(u)r/- aw-ru, -ew-r(u)
Genitive	-yä, -o-ä, -u-ä	-ä	-ä
Topical	-ri	-iri	-ri

Table 5. Na’vi case endings (Annis, 2010–2024: 17).

Vowels *o* and *u* trigger the genitive -ä. All the other vowels trigger the genitive -yä.

Number is specified via prefixes and can indicate singular, dual, trial, or plural nouns or pronouns. Additionally, each number category (singular, dual, trial, and plural) creates lenition due to the addition of a prefix. For example:

Dual *me+* e.g (po ‘he/she’) > *mefo* ‘they’

Trial *pxe+* e.g (kilvan ‘river’) > *pxehilvan* ‘rivers’

Plural *ay+* e.g *swizaw* ‘arrows’ (No lenition occurs since the consonant “s” does not abide by the lenition rules.)

(Annis, 2010–2024: 18)

+ e.g. tokx ‘body’ > *aysokx*.

**aytokx* becomes *aysokx* ‘bodies’ through lenition since the consonant “t” is compatible with the lenition rules (Frommer, 2009).

In order to concretize the demonstrated case and number markers, I will attempt to apply them to a vowel-ending noun *kxetse* ['k'ɛ.tsɛ] 'tail' taken from the Na'vi-English dictionary compiled by Roland "Titstewan" R. S (2026: 20).

	Singular	Plural
Subjective	<i>kxetse</i>	<i>Ay+kxetse</i>
Agentive	<i>kxetse-l</i>	<i>Ay+kxetse-l</i>
Patientive	<i>kxetse-t</i>	<i>Ay+kxetse-t</i>
Dative	<i>kxetse-r</i>	<i>Ay+kxetse-r</i>
Genitive	<i>kxetse-yä</i>	<i>Ay+kxetse-yä</i>
Topical	<i>kxetse-ri</i>	<i>Ay+kxetse-ri</i>

Table 6. Demonstration of case and number inflection on the noun *kxetse*. Lenition is observed in the mutation of ejective *kx* /k'/ to *k* /k/ due to the addition of the plural prefix *ay-*.

Person	Singular	Dual	Trial	Plural
1st exclusive	<i>oe</i> 'I'	<i>moe</i> 'Us two'	<i>pxoe</i> 'Us three'	<i>Ayoe</i> 'We'
1st inclusive	—	<i>oeng</i> 'Us two'	<i>pxoeng</i> 'Us three'	<i>ayoeng, awnga</i> 'Us'
2nd	<i>nga</i> 'You'	<i>menga</i> 'You two'	<i>pxenga</i> 'You three'	<i>Aynga</i> 'You all'
3rd animate	<i>po</i> 'he/she'	<i>mefo</i> 'They'	<i>pxefo</i>	<i>ayfo, fo</i> 'They'
3rd inanimate	<i>tsa'u, tsaw</i> 'That'	<i>mesa'u</i>	<i>pxesa'u</i>	<i>aysa'u, sa'u</i>
Reflexive	<i>sno</i> 'Himself, herself, itself'	—	—	—
Indeterminate	<i>fko</i> 'They/unspecified'	—	—	—

Table 7. Na'vi pronouns (Annis, 2010–2024: 19).⁴⁵

Gender differentiation does not appear in Na'vi. If necessary, gender can be marked through suffixes *-e* for female and *-an* for male. For instance, the noun *karyu* alone stands for teacher.

⁴⁵ Translations are taken from the Na'vi-English dictionary: <https://learnnavi.org/navi-vocabulary/> (Last accessed 20.03.2026)

If one wants to refer to a male teacher, it becomes *karyuan*, and a female teacher *karyue* (Destrueel, 2016: 30).

Verbs are also subject to inflection for tense, aspect, mood, and speaker attitude. However, they are not inflected for person or number. Verbs are inflected through either first or second-position infixes. Tense, aspect, and mood are indicated via first-position infixes, whereas speaker attitude (positive, negative, neutral) is indicated via second-position infixes. Na’vi has five tenses for indicating time: present tense, past proximate tense, past general tense, future proximate tense, and future general tense. Aspect can be either perfective or imperfective (Frommer, 2009).

	Tense only	Perfective	Imperfective
Future	<i>-ay or -asy</i>	<i>-aly</i>	<i>-ary</i>
Near future	<i>-iy or -isy</i>	<i>-ily</i>	<i>-iry</i>
General	—	<i>-ol or -er</i>	<i>-er</i>
Near past	<i>-im</i>	<i>-ilm</i>	<i>-irm</i>
Past	<i>-am</i>	<i>-alm</i>	<i>-arm</i>

Table 8. First-position infixes for indicating tense and aspect (Annis, 2010–2024: 25).

Positive attitude	<i>-ei or -eiy</i>
Negative attitude	<i>-äng or -eng</i>
Formal, ceremonial	<i>-uy</i>
Inferential, suppositional	<i>-ats</i>

Table 9. Second-position infixes for indicating speaker attitude (Annis, 2010–2024: 25).

Taron (hunt)		
Tense only	<i>tìmaron</i> ‘just now hunted’	<i>tayaron</i> ‘will hunt’
Aspect only	<i>teraron</i> ‘be hunting’	<i>tolaron</i> ‘have hunted’
Tense and Aspect	<i>tìrmaron</i> ‘was just now hunting’	
Positive attitude	<i>tìrmareion</i> ‘was just now hunting/speaker feels positive about hunting’	
Negative attitude	<i>tayarängon</i> ‘will hunt/speaker feels negative about hunting’	

Table 10. Application of tense, aspect, and speaker attitude to the verb *taron* (Frommer, 2009).

To form adjectives, the affix *-a-* is used. Adjectives can both precede and succeed the noun they modify, so they can act either as a prefix or a suffix. The two following examples are acceptable and represent ‘long river’, where *ngim-a* stands for ‘long’ and *kilvan* for ‘river’:

ngim-a kilvan

kilvan a-ngim (Destruel, 2016: 30).

3.3.2. Lexicon

The lexicon, as well as the language itself, for Na’vi was developed on an *as-needed* basis, as explained by Frommer.⁴⁶ According to kelutral.org, Na’vi has more than two thousand nine hundred words in its lexicon. In his 2020 Harvard talk⁴⁷, Frommer illustrated the essential four ways through which the word-building process takes place, and the Na’vi lexicon is constructed. First and the least preferred option is to borrow words (borrowing) from other languages and filter them through the Na’vi sound system. For instance, until the arrival of sky people (humans), Na’vi had no word for “book” since the language didn’t have a writing system and therefore did not need a word for book. However, once humans arrive in Pandora and opened schools, the Na’vi borrowed the word book and turned it into the Na’vi *puk*. The second way of creating new words is through the derivational process, in which derivational morphemes are utilized. New words can be derived through either prefixes or suffixes. Nevertheless, Na’vi is not consistent in having productive derivational affixes; therefore, it is advised to consult a dictionary. Prefixes *tì-* and *sä-* are used to form nouns from verbs and adjectives. Neither of these prefixes is productive and is not to be coined freely. While the prefix *tì-* refers to the abstract concepts, *sä-* is used to talk about a particular phenomenon or instrument.

Tì-

(V > N) *hawnu* v. ‘protect’ becomes *tìhawnu* n. ‘protection’ (in general)

(ADJ > N) *kanu* adj. ‘intelligent’ becomes *tìkanu* n. ‘intelligence’

Sä-

(V > N) *tsyìl* v. ‘climbing’ becomes *sätsyìl* n. ‘a climb’ (refers to a specific instance of a climb)

⁴⁶ To be found in the “Development of the Language” section at: <https://www.youtube.com/watch?v=-AgnLH7Dw3w> (Last accessed 20.03.2026)

⁴⁷ Talk in question: https://youtu.be/28gzy1X1cOs?si=ZeYq5AbqG1_q-xJx&t=2763 (Last accessed 21.03.2026)

(ADJ>N) *spxin* ‘sick’ becomes *säspxin* ‘sickness, disease’ (Frommer, 2012).

Adverbs are formed through the insertion of the prefix *nì-*. When used to form adverbs from adjectives, it is a productive affix; if used with other parts of speech, a dictionary is to be consulted (Frommer, 2010).

nìftue adv. ‘easily’ from *ftue* adj. ‘easy’

nìtam adv. ‘enough’ from *tam* v. ‘to suffice’ (Annis, 2010–2024: 30).

Diminutive form can be created through the addition (to a noun or pronoun) of the suffix *-tsyìp* to:

1. Refer to smaller versions of a noun

puk n. ‘book’ *puktsyìp* n. ‘booklet, pamphlet’

säspxin n. ‘illness, disease’ *säspxintsyìp* n. ‘minor ailment’

2. Express affection

’itetsyìp. ‘Little daughter. (might as well be used for an adult daughter.)’

3. Express insult

Fitaronyutsyìp ‘(worthless) little hunter’ (Frommer, 2010).

The agent of an action can be indicated through *-tu* (unproductive) and *-yu* (productive; acts as *-er* in English) suffixes.

Pamtseotu ‘musician’ from *pamtseo* ‘music’

Taronyu ‘hunter’ from *taron* ‘hunt’ (Annis, 2010–2024: 31).

The third way is using already existing elements and combining them with one another. Frommer uses the word *nìfkeytongay* /nì.fkej.to.ŋaj/ (actually, as a matter of fact) to demonstrate one such instance. The composition of the word is: *nì* (adverbial marker) + *tifkeytok* ‘state, condition/situation’ + *angay* ‘true’. As a result, the word “actually” becomes *a true situation*. Fourth and the last way to come up with new words is simply finding or thinking of new roots. As explained in 3.3, the proposal and approval of words for the Na’vi language belongs to the creator Paul Frommer only. He explains that the crucial point to consider while coming up with new roots is their reflection of the word to be created itself. For instance, *ftue*

is the word for English ‘easy’ pronounced /'ftu.ɛ/. As can be noticed, the word itself is also quite easy to pronounce. The word for “difficult”, on the other hand, is *ngäzik* /'ŋæ.zɪk/, and is more effortful to pronounce as explained by Frommer. Below is a list of some representative vocabulary selected from the Na’vi-English dictionary.

- **‘akra** [ˈʔak.ra] *n.* soil (fertile)
- **eyktan** [ˈɛj̥k̥.tan] *n.* leader
- **ioang** [i.ˈo.aŋ] *n.* animal, beast
- **meoauniae** [ˌmɛ.o.a.u.ni.a.ˈɛ.a] *n.* harmony, living at one with nature
- **kafiuran** [ˈka.fi.u.ran] *n.* sailboat
- **kelku** [ˈkɛl.ku] *n.* home, house
- **ketuwong** [ˈkɛ.tu.woŋ] *n.* alien
- **lehrrap** [lɛ.ˈhɾ.ap] *adj.* dangerous
- **na’ring** [ˈnaʔ.rɪŋ] *n.* forest
- **nivi** [ˈni.vi] *n.* sleeping hammock (general term)
- **ngä’än** [ŋ.æ.ˈʔæn] *vin.* suffer mentally or emotionally, be miserable
- **ngop** [ŋ.ɔp̥] *vtr.* create
- **ngopyu** [ˈŋop.ju] *n.* creator
- **olo’** [o.ˈloʔ] *n.* clan
- **pa’li** [ˈpaʔ.li] *n.* direhorse
- **palon** [ˈp.a.l.on] *vin.* Burn
- **pay** [paj] *n.* water, liquid
- **paymaut** [ˈpaj.ma.ut̪] *n.* fountain tree
- **prismung** [ˈpɾ.smʊŋ] *n.* baby carrier
- **rayl** [ˈrajl] *adj.* feeling pity and sorrow for someone’s misfortune
- **swoa** [ˈswo.a] *n.* intoxicating beverage, or “spirits”
- **tiaho** [ti.a.ˈho] *n.* prayer (in general, abstract idea)
- **tiretu** [ti.ˈɾɛ.tu] *n.* shaman
- **tisyimawnun’i** [ti.sji.maw.nʊn.ˈʔi] / [tsji.maw.nʊn.ˈʔi] *n.* independence, freedom from a pre-existing relationship
- **tsamkuk** [ˈtsam.kʊk̥] *n.* war drum
- **txantompa** [tʰan.ˈtom.pa] *n.* rainstorm, heavy rain
- **txep** [tʰɛp̥] *n.* fire
- **txumnga’** [tʰʊm.ŋaʔ] *adj.* poisonous
- **wuwuk** [ˈwʊ.wʊk̥] *n.* lizard; any of a variety of lizard-like creatures
- **yafkeyk** [ˈja.fkɛjk] *n.* weather
- **yrr** [jɾ] *adj.* wild, natural (something in its original, unmodified, untampered-with natural state)
- **zong** [z.ɔŋ] *vtr.* save, defend

3.3.3. Syntax

3.3.3.1. Word Order

The Na’vi syntax is observed to be flexible and often described as following a free word order. The terminology “free word order” is, however, wrongly used in this context. The

appropriate term would be free *constituent* order, and the constituents would refer to a meaningful unit of words that can function as a grammatical unit (Annis, 2010–2024: 64). Nevertheless, neither the term free word order nor the free constituent order implies haphazard usage of grammatical units within a sentence. While the Na’vi language allows for all six possible combinations of the subject-verb-object order within a sentence: SVO, SOV, VSO, VOS, OSV, and OVS, it favours VSO the most⁴⁸, and the other orders least (Annis, 2010–2024: 64; Frommer, 2009). Within the discourse-configurational framework proposed by Kiss (1995), languages with free word order are analysed as languages whose constituent order is strongly influenced by discourse requirements rather than by grammar.⁴⁹ In Na’vi, this feature can be observed in the presentation of old information via fronting. Old information can be found at the head of a clause in Na’vi:

pot tsun oe tspivang niftue: I could kill **him** easily (OVS)

ikranti makto: take **the ikran** (OV)

fkol pole’un fi’ut: **this** has been agreed (SVO) (Annis, 2010–2024: 67).

3.3.3.2. Transitivity

Another prominent syntactic feature of Na’vi is its transitivity marking. Na’vi, in essence, marks the subjects of transitive and intransitive verbs differently, unlike most human languages. This is known as *tripartite alignment* (Annis, 2010–2024: 36; Frommer, 2020). In morpho-syntactic typology, three distinct positions for the participants in action are assigned. The subject of an intransitive verb (S), the agent of a transitive verb (A), and the patient of a transitive verb (P). However, in the major alignment systems, namely nominative-accusative, absolutive-ergative, and active-split alignment, these participants are treated and grouped differently. In a nominative-accusative system, like German or Latin, the same markers are used for the subject of both transitive and intransitive verbs while separating the object. Conversely, in an absolutive-ergative system, such as Basque or Inuktitut, the subject of an intransitive verb and the object of a transitive verb share the same marking, while the agent of a transitive action is isolated as a differently marked category. In an active-split system such as Georgian, the subject of an intransitive verb is marked either like the agent of a transitive verb or like the object of a transitive verb. The marking differs according to whether the action is

⁴⁸ According to The World Atlas of Language Structures (WALS), VSO is typologically less common than SOV and SVO orders within the sampled languages. <https://wals.info/chapter/81> (Last accessed 19.05.2026)

⁴⁹ This assumption aims to elucidate the nature of languages and is not universally shared.

performed voluntarily or experienced involuntarily (Dixon, 1979). Finally, the tripartite system, observed very rarely in languages such as Nez Perce (Nimipuutímt), assigns separate markers or cases to all three roles: the intransitive subject, the transitive agent, and the transitive object. Therefore, each role has its distinct marking. The following examples demonstrate how the subject of a transitive verb (1) receives the case ending “-il” whereas the subject of the intransitive verb (2) has no marked ending.

1. *Nantangil* (S) *frip* (V) *tutet* (O). ‘The viperwolf bites a person.’
2. *Nantang* (S) *hahaw* (V). ‘The viperwolf sleeps.’⁵⁰

Reflexives and causatives are also affected by this feature. Reflexive verbs are created through the insertion of *-äp* infix and are always intransitive, while causative verbs with the *-eyk* infix are always transitive. The causative reflexive is, therefore, formed with the combination of *-äp* and *-eyk* infixes. Such as in *Po täpeykerkup* ‘He causes himself to die.’ The transitivity of the initial expression determines the case use of the causative reflexive. For example, if the original expression is intransitive, *-äp* dominates, and the subject takes the subjective case. However, if it is transitive, *-eyk* dominates, and the subject takes the agentive case. Such as in:

Oe (No case)⁵¹ *täpeykaron*. ‘I cause myself to hunt.’

Oel (Ag.) *täpeykaron yerikit*. ‘I cause myself to hunt yerik.’ (Annis, 2010–2024: 24–36).

3.3.3.3. Negation

In order to negate a sentence, Na’vi uses *ke*. Such as in *Po pamrel ke si* ‘He doesn’t write’ or *kelfpomtokx* ‘unhealthy’ from *lefpomtokx* ‘healthy’ (Annis, 2010–2024: 31–55).

3.3.3.4. Interrogative form

Questions in Na’vi are formed through the particle *srak(e)*. It can occur both at the end and the beginning of a sentence. Whether to use *srak* or *srake* depends on its placement within the sentence. If it appears at the beginning, *srake* is used, whereas *srak* is used at the end of the sentence.

Ngaru lu fpom srak? ‘Are you well?’ (Annis, 2010–2024: 54).

⁵⁰ Examples taken from: <https://learnnavi.org/navi-grammar/> (Last accessed 20.05.2026)

⁵¹ Subjective case expressed by zero morpheme.

Negative questions are composed when the negative *ke* is added. They are, however, not as straightforward as regular questions and have a deeper semantic level. The underlying reason for asking a negative question stems from the confirmation or rejection of a pre-existing belief about the addressee (Silk, 2020). Therefore, if one wishes to confirm the questioner, the answer to the negative question would be *srane*, whereas it would be *kehe* if the questioner is wrong about their pre-existing belief. Consider the following examples:

- *Nga lu Txewi srak?* ‘You are Txewi?’ The questioner is asking if the statement is true or false. An answer of *Srane* means, “Yes, it’s true.” *Kehe* means “No, it’s not true.”
- *Nga ke lu Txewi srak?* ‘You are not Txewi?’ The questioner is asking if the statement is true or false. An answer of *Srane* means, “Yes, it’s true. I am not Txewi.” *Kehe* means “No, it’s not true. I am Txewi” (Frommer, 2018).

WH Questions are created through the attachment of *-pe* to a question word. However, it does not carry the requirement of appearing at the beginning of the sentence, unlike many other human languages.

- *Kempe si nga?* ‘What are you doing?’
- *Fıswiräti ngal **pelun** molunge fitsenge?* ‘Why did you bring this creature here?’ (Annis, 2010–2024: 55).

3.3.3.5. Conjunctions

Annis (2010–2024: 61–62) lists nine conjunctions utilized in Na’vi.

1. **Alu:** ‘That is, in other words’ The primary task of *alu* is to merge nouns.

Example: *Tsalsungay tsali’u **alu** zeykuso lu eyawr.* ‘Nonetheless, that word, **namely** zeykuso, is correct.’

2. **Ftxey:** ‘Whether... or’

Example: *Silpey oe, ... frapo - **ftxey** sngä’iyu ftxey tsulfätu - tsiyevun fitsenge rivun ’uot lesar* ‘I hope ... everyone - **whether** beginner **or** expert - will be able to find something useful here.’

3. **Fu:** ‘Or’

Example: *Rä'ä fmivi livok **fu** emkivä ayekxanit a fkol ngolop fpi sikhuke ayfrtuä si ayioangä* 'Do not attempt to approach **or** cross any barriers designed for guest and animal safety.'

4. **Ki:** 'But rather, but instead'

Example: *Nga plltxe ke nifyeyntu **ki** ni'eveng* 'You speak not like an adult **but** a child' (Frommer, 2010)

5. **Si:** 'And' The conjunction is used for creating lists and connecting the elements of a similar idea. It is not used to merge clauses, which is done via *Ulte* (See the subsequent matter.)

Example: *Ma smukan **si** smuke* 'Brothers **and** sisters.'

6. **Ulte:** 'And' For connecting clauses.

Example: *Oel ngati kameie, ma tsmu-kan, **ulte** ngaru seiye irayo* 'I see you, brother, and thank you.'

7. **Tengkrr:** 'While, in the meantime.'

Example: *Fitxon yom **tengkrr** teruvon* 'On this night (we) eat while leaning.'

8. **Tik:** 'Immediately' (adv.) Used to indicate an action that is followed by an outcome immediately after the initial action.

Example: *Füoang ke tsun slivele; nemfapay zup **tik** spakat* 'This animal cannot swim; (if) it falls into the water, it **immediately** drowns' (Frommer, 2021).

9. **Tsnì:** 'That' Used for reporting.

Example: *Silpey oe **tsnì** fitioeykting law livu ngaru set* 'I hope **that** this explanation is clear to you now' (Frommer, 2011).

3.4. Reflections of culture in Na'vi language and implications for Whorfianism in Avatar

As discussed in the Introduction, language and culture are very much intertwined, and the contribution of culture to language is undeniable. Within this perspective, Na'vi presents a decent portrayal of a language that reflects its culture. The Na'vi language contains many

components embedded within the Na’vi culture. The culture reveals itself even from as early as the morphological level. As discussed in 3.2, ceremonies are of great importance for the Na’vi people. This importance is reflected in their pronoun preference according to whether the event is a regular or a ceremonial one (Check Table 7 for pronoun reference). Below is a demonstration of the pronoun transformation if intended to be used in a ceremonial circumstance.

Regular	Formal/Ceremonial
<i>Oe</i>	<i>Ohe</i>
<i>Nga</i>	<i>Ngenga</i>
<i>Lu</i>	<i>Luyu</i>

Table 11. Comparison of formal and ceremonial Na’vi pronouns (Frommer, 2020).

The lexicon of the Na’vi is rich with its demonstration of nature, which is an inseparable and crucial part of the Na’vi culture.

Na’vi	English
1. <i>Meoauniaea</i>	Harmony, living at one with nature
2. <i>Eywa’eveng</i>	Pandora
3. <i>Eywa k’sei nivi’bri’sta</i>	Eywa cradles all
4. <i>Kiyevame ulte Eywa ngahu</i>	Goodbye, and Eywa be with you
5. <i>Oel ngati kameie</i>	I see you

Table 12. A list of Na’vi words and phrases reflecting the Na’vi culture (Suprycheva, 2023: 18).

1. *Meoauniaea* reflects the Na’vi perception of Eywa and how it surrounds and embraces the whole moon (Suprycheva, 2023: 18).
2. While the humans refer to the planet in which Na’vi people live as Pandora, Na’vi themselves call it *Eywa’eveng*, where *Eywa* represents their goddess and *eveng* means child. Therefore, Pandora the moon becomes the child of Eywa (Suprycheva, 2023: 18).
3. As also mentioned in 3.2, Na’vi tend to sleep together and with their families in their hammocks under the Hometree. This practice is mirrored in the phrase *Eywa k’sei nivi’bri’sta*, in which Eywa is presented as the mother of all.
4. The Na’vi adjoins their goodbye *Kiyevame* with Eywa be with you *ulte Eywa ngahu*.
5. *Oel ngati kameie* ‘I see you’ is a very frequent expression in Na’vi used for greeting. However, the act of seeing is not restricted to seeing the person physically, but also

seeing *into* that person, seeing their inner world, and accepting them, so to speak (Destrue, 2016: 29; Frommer, 2018⁵²).

Proverbs are also influenced by the Na’vi culture and characteristics.

Na’vi	English
1. <i>Kxetse sì mikyun kop plltxe.</i>	The tail and ears also speak.
2. <i>(Na) loreyu awnampi.</i>	(Like) a touched <i>Helicoradian</i> .

Table 13. A pair of Na’vi proverbs reflecting the Na’vi culture (Frommer, 2020).

1. The proverb *Kxetse sì mikyun kop plltxe* ‘The tail and ears also speak’ is used to emphasize that it is not enough to just listen to words, but one must also look at the body to interpret the message from the interlocutor correctly.
2. The *Helicoradian* is a plant that is known for its defence response in Pandoran fauna. Once touched, it zooms out and closes itself off to the outer world. Consequently, the proverb is attributed to shy people.

In one of his interviews, where he explains the Sapir-Whorf hypothesis, Frommer elaborates that the weak version of the hypothesis states that the languages we speak can influence the way we habitually think about reality, and that it also applies to the Na’vi language. He discusses that the lexicon of Na’vi is very culturally specific and reflects the Na’vi worldview.⁵³ Similarly, in a webinar, while explaining the constraints he encountered in creating the Na’vi language, Frommer recounts receiving public comments about the convenience of reviving a dying language rather than creating a new one for the movie. He explains, “That would not work because every language is tied to its environment, tied to its culture, tied to its people who speak it.”⁵⁴

⁵² To be found at the last part: https://youtu.be/IDZCM2wOoKU?si=npEmGfXja_ae9zMy&t=2174 (Last accessed 25.03.2026)

⁵³ Back Seat Socialism: Does language determine reality? W/Dr. Paul Frommer “Avatar” Film Consultant: https://youtu.be/UVFD_sVx2wo?si=0WjOkjdmf8ueIdoB&t=933 (Last accessed 28.03.2026)

⁵⁴ Related explanation by Frommer can be found at the “Externally imposed constraints” part starting at 17.22 in <https://youtu.be/sN0KMQIHLx0?si=odXO1uHqypj0S11L&t=1042>



Image 17. Jake touching a Helicoradian.⁵⁵

Jake had to learn the Na'vi language to be accepted and acknowledged in the Na'vi society and treated as one of them. All these dimensions of the Na'vi language that have been mentioned so far might have affected Jake in a way that transformed his previous human worldview. In the first *Avatar* movie (2009), we observe that Jake comes from an English-speaking background that is associated with violence and war. Humans in the movie are portrayed as harsh as they can be, and their language reflects this harshness as well. The Na'vi language, on the other hand, is a language of peace and connection with nature. Paliy (2012: 6) explains, “The politic-driven human language system is perverted - its lexicon is often used for warfare, conflict, and indecency. [...] Here (Pandora), language is used for beauty, spirituality, and communication with the earth, sky, and sea.” The outcome of this shift from a violent language to a spiritual one appears in Jake's very personality. When first encountered with the native Na'vi people, Jake was in no possession of knowledge of the Na'vi people, traditions, or language by any means. To start with a specific and important instance, Jake initially struggled with internalizing the greeting *Oel ngati kameie* ‘I see you.’ As discussed in this chapter, the act of seeing in this phrase is not limited to physically seeing, but it is also seeing *into* the speaker. However, while his teammate Norm was explaining the phrase to him as “But it's not just I see you in front of me, it's I see into you. I'm accepting you, I understand you. So you gotta get this, okay?” (Minutes 01.07.55–01.08.10 in *Avatar* (2009)) Jake is shown slightly laughing and wrapping his hands around his head because he wasn't able to understand the underlying meaning as a non-native Na'vi speaker. As he started getting advanced in Na'vi, however, he also began to comprehend the purity of the Na'vi language in contrast to the hostile English he used to speak (Lambert, 2023). In a sense, as Jake learned the language, he also learned to *see*. He adopted the Na'vi worldview of being one with nature (which is present in their language), respecting

⁵⁵ Taken from Avatar Wiki: <https://james-camerons-avatar.fandom.com/wiki/Helicoradian> (Last accessed 28.03.2026)

it, and living in peace without harming any. Lambert (2023: 62) describes this transformation as such:

By the end of the film, Jake has learned the language of the Na'vi - or at least, learned as much as is possible in the course of a few months - as well as their philosophy and, to a certain extent, their perspective of the world. [...] Jake goes from only knowing English and the violence of war, to learning Na'vi and the peace that can exist if one learns to respect nature and others. It is thus possible to argue that he has learned to understand the worldviews of the Na'vi through their language, as it contains many concepts that were at first unknown to him.

While it is, of course, not very plausible to claim that the language is the sole reason for Jake's transformation, it can obviously be considered a contributing factor alongside his interaction with the native Na'vi. Jake's transformation can simply be interpreted as a character shift; nevertheless, it can also be explained in terms of linguistic relativity. As Sapir (1985: 62) highlighted, "The 'real world' is to a large extent unconsciously built up on the language habits of the group." The Jake who was once struggling to comprehend the world of the Na'vi came to be one of the members of that world and learned to live in harmony with it. As he acquired the culturally specific expressions and conceptual categories (such as ceremonial vs. everyday pronouns, emphasis on nature and spirituality, etc.), his mindset also started reflecting that of the Na'vi. Accordingly, even though the movie does not explicitly theorize the Sapir-Whorf hypothesis, it still exemplifies the weaker version of it by showing how a person's worldview can be gradually altered through exposure and immersion in a new language and culture. Lambert (2023: 61) also asserts:

[...] according to this less controversial version of the concept of linguistic relativity, an individual's perception of the world changes in accordance with the language that this individual speaks as well as the culture that they are a part of (Kramsch 32). It is, to a certain extent, what happens to Jake. As he learns the language of the Na'vi as well as their culture, Jake's perception of the world, of humanity, and of the Omatikaya themselves changes. Since he spends as much time as possible living among the Omatikaya, he adopts their view of the world.

The transformative power of language is also present in the second *Avatar* movie: *The Way of Water* (2022). In search of Jake, Colonel Quaritch is shown in his new Avatar body and attempts to behave like a Na'vi to reach Jake more easily. While narrating his plan to his team, he emphasizes that in order to behave and think like a Na'vi, it is essential that they speak Na'vi (Minutes 01.01.59–01.02.21 in *Avatar* (2022)). The significance attributed to the language by the Colonel, once again, emphasizes the relationship between language and thought and, consequently, builds a tacit reference to the Sapir-Whorf hypothesis.



Image 18.

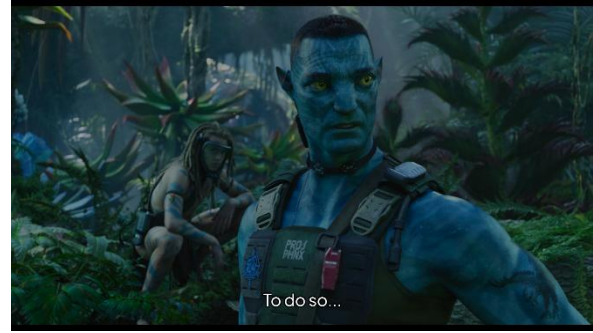


Image 19.

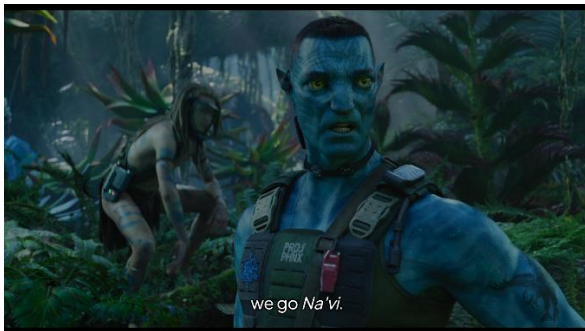


Image 20.



Image 21.

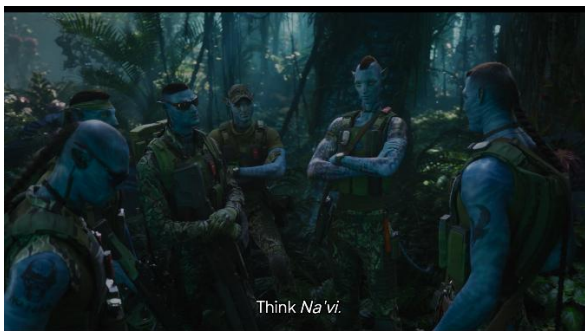


Image 22.



Image 23. Colonel speaking Na'vi.

As shown in 3.3.3.2, Na'vi differentiates between transitive and intransitive verbs and assigns different cases to each. The demonstrated tripartite nature requires Na'vi speakers to have a clear and early understanding of the concept of transitivity (Annis, 2010–2024: 36). The obligation for both native speakers and learners to maintain a deeper understanding of the concept of transitivity is not merely trouble for language acquisition. Because Na'vi utilizes a tripartite alignment, it marks the participants in an action separately: the subject of an intransitive verb (S), the agent of a transitive verb (A), and the patient of a transitive verb (P). From a neo-Whorfian perspective, while this obligatory grammatical marking does not determine cognition, it may increase speakers' attentiveness to the relational structure of actions. While a speaker of a nominative-accusative language like English uses the same case for the “self” regardless of whether their action impacts another entity, a Na'vi speaker is

grammatically required to encode whether their action is detached or flows outward and affects the environment. In this sense, the explicit marking of the agent (-i/l) in transitive clauses can therefore be interpreted both as a syntactic feature and as a discursive device that emphasizes responsibility and intentional action. As linguistic anthropologist Alessandro Duranti (1994:125) notes in his study of Samoan political discourse, the explicit morphosyntactic marking of an Agent can be read as a discursive framing device and a ‘willful initiator of an event that is depicted as having consequences for either an object or animate patient.’ (p.125)⁵⁶. Given his human background, this shift is profound for a character like Jake, who comes from a language that often revolves around dominance and the “self” as an independent actor. He was no longer simply an actor since he had to habitually recognize his place as either an entity in a state of being (intransitive) or as a participant in a cause-and-effect web (transitive). While the degree to which a specific syntactic alignment can truly restructure human cognitive orientation remains a topic of debate within empirical linguistics, it is evident that Na’vi was designed in a structure that entails a grammatical distinction that is in line with the narrative’s thematic focus on nature and balance.

4. Dune and linguistic power

4.1. Narrative context of Dune

Directed by Denis Villeneuve and distributed by Legendary Pictures, *Dune* (2021) is the movie adaptation of the novel written by Frank Herbert in 1965 and the first instalment of the *Dune* film trilogy. The cast includes Oscar Isaac as the Duke Leto Atreides, Timothée Chalamet

⁵⁶ For a detailed empirical analysis of how morphosyntactic alignment governs the social framing of agency, see Duranti, A. (1994). *From grammar to politics: Linguistic anthropology in a Western Samoan village*. California: University of California Press (Particularly Chapter 6, *The Grammar of Accountability*). Samoan (*Gagana Sāmoa*) is an ergative-absolutive language spoken by the Polynesian people. It utilizes the particle *e* to explicitly mark the Agent of a transitive verb, while leaving the Subject of an intransitive verb and the Patient of a transitive verb morphologically unmarked (in the absolutive case). Duranti’s ethnographic analysis of political speeches (*fono*) revealed that the explicit introduction of an ergative Agent is a highly calculated rhetorical choice. Consequently, powerful political actors systematically projected blame onto political rivals by framing them as explicit ergative Agents in transitive clauses associated with negative outcomes. This real-world correlation between ergative syntax and the habitual interpretation of agency provides a useful point of view for observing how Na’vi’s tripartite alignment may shape understandings of agency and responsibility. Although syntactic alignment systems do not produce identical social effects across all languages, Duranti’s ethnographic analysis illustrates an instance where the explicit morphosyntactic marking of agency can become integrated into broader cultural practices of accountability and event interpretation.

as the heir Paul Atreides, Rebecca Ferguson as Paul Atreides' mother Lady Jessica, Zendaya as a Fremen girl Chani, Stellan Skarsgård as the leader of House Harkonnen and the lead enemy to House Atreides Baron Vladimir Harkonnen, Jason Momoa as Paul's mentor Duncan Idaho, and Javier Bardem as the leader of the Fremen tribe Stilgar. The trilogy is composed of *Dune* (2021), *Dune: Part Two* (2024), and *Dune: Part Three* as the final instalment based on the second novel *Dune Messiah* to be released in 2026. Upon its release, *Dune* (2021) became the tenth-highest-grossing film of 2021 and reached a rating of 8/10 on IMDb, followed by *Dune: Part Two* (2024) reaching even a higher rating of 8.4/10.

Dune (2021) is set in a distant future on the inhospitable desert planet *Arrakis*, which stands as the repository of the spice called *Melange* that is essential for interstellar travel. The spice in Arrakis is portrayed as a powerful resource that assigns either power or weakness to an empire. In fact, its strength is attributed so much value that the movie opens with Chani's prologue about spice, and how the Harkonnen took over spice production and exploited the Fremen due to their access to spice sources.

My planet Arrakis is so beautiful when the sun is low. Rolling over the sands, you can see spice in the air. At nightfall, the space harvesters land. The outsiders race against time to avoid the heat of the day. They ravage our lands in front of our eyes. Their cruelty to my people is all I've known. These outsiders, the Harkonnens, came before I was born. By controlling spice production, they became obscenely rich. Richer than the emperor himself. Our warriors couldn't free Arrakis from the Harkonnens (Minutes 00.00.55–00.02.49 in *Dune* (2021)).

Also, due to its ecological status, the desert's scarcity of water necessitated the frugal use of water resources and harvesting water via windtraps.

The narrative follows Paul Atreides, whose family leaves their home world, *Caladan*, and is dragged into a war over control of Arrakis. The first scene is a meeting between the messengers of Emperor Shaddam, who rules the Imperium, and the head of the noble Atreides family, Duke Leto Atreides. During the meeting, Duke Leto is reported to have been assigned by the Emperor to substitute for Baron Vladimir Harkonnen as the ruler of Arrakis. However, the Duke appears to be aware of the Emperor's plan to eliminate the House Atreides and to hand Arrakis to House Harkonnen. Duke's partner, Lady Jessica, is a member of the *Bene Gesserit* sisterhood whose women possess advanced physical and mental powers over regular humans. As part of the Bene Gesserit crossbreeding tradition, Lady Jessica was instructed to bear a daughter whose son would become the messiah. However, Jessica gave birth to a son, Paul.

Throughout the movie, Paul has disturbing visions of the future in Arrakis and of a young Fremen woman. After the meeting with the messengers of the emperor, Paul finds himself awakened by his mother and learns that the Emperor's Truthsayer, Mother Gaius Helen Mohiam, is expecting to meet him about the prophecies in his dreams. After Mother Mohiam gives Paul the lethal *Gom Jabbar* test, during which Paul must endure great pain, she notifies Lady Jessica that Paul might be *the one* they have been waiting for.

Shortly afterwards, House Atreides reaches *Arrakeen*, the first settlement of Arrakis inhabited by the Fremen who speak the Chakobsa language. In Arrakeen, Paul is greeted as *Lisan al-Gaib*, the Fremen name for Messiah. However, soon after their arrival, Paul was subject to an assassination attempt by the Harkonnens. The attempt, nevertheless, failed when Paul disabled the assassin thanks to his previous training. In the meantime, the Sardaukar forces of the emperor were beginning to organize the Imperial Army into battle groups. During the attack, House Atreides was betrayed by their family doctor, Dr. Yueh, who disabled Arrakeen's shields and, therefore, enabled the Harkonnen invasion. However, as a last act of help, Dr. Yueh replaced one of Duke Leto's teeth with a poisonous gas capsule with which the Duke can assassinate the Baron, but at the price of killing himself at the same time. Eventually, the Duke kills himself and the Baron's mentat, but the Baron survives nevertheless.

During the invasion, Lady Jessica and Paul were taken hostage by Harkonnen soldiers on a ship, which they later escaped thanks to Lady Jessica's Bene Gesserit power, *the Voice*. Overnighing in the desert, with the impact of spice surrounding them, Paul had visions of a bloody holy war fought across the universe in his name. When one of Paul's mentors, Duncan, eventually found Jessica and Paul, he brought them to an old ecological testing station where they would be safe. However, shortly after arriving, Duncan was killed by the Sardaukar troops while trying to save time for Jessica and Paul to escape. Jessica and Paul managed to flee on a plane, and upon their crash in the desert, they were surrounded by Fremen, led by Stilgar. Paul, however, was distracted by Chani, who was the girl from his dreams. In the meantime, after taking over Arrakis, Baron Harkonnen assigned his nephew Rabban to rule the planet. Fremen were initially not eager to accept Jessica and Paul into their tribe, but after witnessing both of their fighting skills, they accepted them, even reluctantly. As they cross the desert with Fremen to reach their fortress, Paul witnesses a Fremen riding on the back of a large sandworm and realizes that it is what his father used to call *the desert power*. The movie ends with Chani telling Paul, "*This is just the beginning.*"

The second movie, *Dune: Part Two* (2024), displays the sequence of events that took place after the House Atreides is destroyed by House Harkonnen. Once Paul arrived in the

Fremen fortress with Stilgar, some of the Fremen welcomed him as their messiah, while some others thought of him as just a false prophecy. Stilgar, however, as a result of the signs he has been observing in Paul, firmly believes that he is the *Lisan al-Gaib* and tries to convince the elders of the community to accept him. Lady Jessica, on the other hand, despite not believing that her son is *the one*, continues to pretend as if he is, which allows her to take the position of the dying Reverend Mother of the Fremen and protect his son. As he integrates into Fremen society, Paul's character undergoes a gradual transformation. During this time, he forms a romantic relationship with Chani and learns essential Fremen practices, including their language, sandworm riding, and methods for interrupting Harkonnen spice production. In the meantime, Lady Jessica insists that Paul travel with her to the South to assemble fundamentalists to maintain the prophecy. However, Paul stays in North and finds out his old mentor is still alive during an attack to stop spice traffickers. The mentor later shows Paul the hidden atomic warheads his father built, which he can utilize in a possible future war. In the meantime, Baron Vladimir Harkonnen removes Rabban from power on Arrakis and appoints Rabban's brother and his preferred successor, Feyd-Rautha. When Feyd-Rautha arrives in North, Paul is dragged to go to South and forced to drink poisonous water to prove that he is the Messiah, but also to see the future clearly. He sees possible futures and discovers that her mother comes from the Harkonnen bloodline. Shortly after, Paul announces himself as *Lisan al-Gaib* in the southern Fremen war council with a hysterical speech. Still not knowing the identity of *Lisan al-Gaib*, the Harkonnens attack Arrakis. However, they face the furious Fremen using atomic warheads of the Atreides house. Eventually, Paul kills the Baron and challenges the Emperor to fight for the throne. When Feyd-Rautha stands as the champion of the Emperor, Paul defeats him in a brutal fight and forces Emperor's daughter to marry him to secure the throne. Upon the Great Houses' message refusing Paul's ascendancy as the Duke of Arrakis, Paul declares war against the Great Houses, and the Holy War officially starts. The movie ends with Chani's refusal to bow to Paul and wandering through the desert alone.

Villeneuve explains that throughout the two movies, he intended the audience to experience events from the protagonist Paul's perspective and to allow the audience to see the world through Paul's eyes.⁵⁷ Therefore, the story world in *Dune* is built through Paul's perspective and through his dreams (Dridi, 2022: 60).

⁵⁷ Related explanation starting at the "Creating the Camera Language" section https://youtu.be/d61KTWkDdgI?si=8Y4SAxe0J7MJ_3dN&t=111 (Last accessed 15.05.2026)

I tried to create a language that is inspiring himself from human faces and landscape, to always be in relationship with the impact of the landscape on my character. Because this movie, at the end of the day, is a journey of a boy that goes out. The deeper he goes into desert, the deeper the movie become introspective. And this new landscape, and from that landscape this new culture that it would meet will transform himself. So, I really tried with the cinema to create that sensation of following a character that immerses himself (Villeneuve, 2022).⁵⁸

4.2. Fremen culture

As presented in *Dune* (2021) and *Dune: Part Two* (2024), Fremen cultural identity is defined by the people's survival instinct in harsh desert conditions. One of Paul's mentors reports that Fremen live in underground caves called the *sietch*, one hosting around 10,000 people, and in Arrakis, there exist hundreds of sietches (in *Dune* (2021), minutes 00.51.47–00.52.06). The most prominent feature of Fremen culture is the importance people place on water due to its scarcity in the desert. Most of the Fremen cultural practices revolve around water. Each community has its own Reverend Mother, who became one by drinking the Water of Life. In the movies, Fremen are portrayed wearing specially designed stillsuits to save and restore the water in their bodies. Once a Fremen dies, the water in their body is drained and transferred to a sacred water reservoir in their sietches, and no member of the community would ever drink it, even on the edge of death (*Dune: Part Two* (2024), minutes 00.19.41–00.20.05). However much the name Fremen strikes a resemblance to “free man”, their nation faces the exact opposite: oppression. Herbert (2003: 180–181) explains:

The native Fremen have blue-within-blue eyes there, and they use an unauthorized planet name in defiance of authority. The name Fremen (pronounced Frem-men) sounds close to “free men,” a suggestion that they are an independent, rebellious tribe who will never permit themselves to be dominated by outsiders. [...] And like the Jews, the Fremen have been persecuted, driven to hide from authorities and survive away from their homeland. Both Jews and Fremen expect to be led to the promised land by a messiah.

4.3. Chakobsa linguistic design

The language spoken by the Fremen in Herbert's novels is called Chakobsa. For the purposes of the two movies, Chakobsa was further elaborated by David J. Peterson and later by

⁵⁸ Denis Villeneuve on following Paul's transformation starting at “Creating the Camera Language” section: <https://youtu.be/d61KTWkDdgl?si=g63pVgyEwDnjVuaE&t=179> (Last accessed 15.05.2026)

Jessie Peterson (in *Dune: Part Two* (2024)) based on Frank Herbert's novel *Dune* (1965). However, due to fundamental changes made in the language, it is now referred to as *Neo-Chakobsa*. Neo-Chakobsa is agglutinative in nature and in possession of approximately 700 words (Popovich & Bortnikov, 2025: 118–120). In his blog⁵⁹, creator David J. Peterson published the orthographical, phonetic, and grammatical structure of the language as well as common Neo-Chakobsa expressions. The original Chakobsa language in Herbert's novels is based on and greatly influenced by the Arabic language (Herbert, 2003: 194). Due to this reliance on Arabic, an already existing language, it is classified as an *a posteriori* language (Futo & Nasehi, 2023; Noletto, 2024). Neo-Chakobsa, however, was created and designed separately for the *Dune* series, with only the main vocabulary kept, and is therefore classified as an *a priori* conlang.⁶⁰

4.3.1. Orthography

The writing system of Neo-Chakobsa is based on the *abugida*, where consonant-vowel (CV) sets are written as units rather than separate letters, and favours more than 1,000 glyphs. Every syllable needs to be in CV form; therefore, vowels as onsets in writing are not acceptable, even though they can be observed in speech. (e.g., a phonetic *e* /e/ is written as “‘e” with glottal stop) (Peterson, 2021: 3).

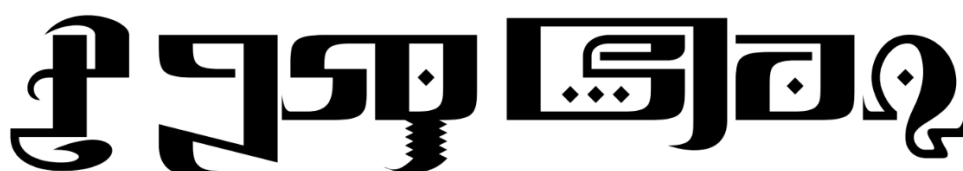


Image 23. Representation of the Neo-Chakobsa writing *O veyz shiidhaga*. ‘The spice must flow.’⁶¹

⁵⁹ Can be accessed at the *dune* and *dune-part-two* sections: <https://dedalvs.com/work/> (Last accessed 29.04.2026)

⁶⁰ Creator David J. Peterson's response on the topic: <http://tumblr.com/dedalvs/747578897401593856/are-chakobsa-and-harkonnen-a-posteriori-languages> (Last accessed 29.04.2026)

⁶¹ Peterson, D. J. (2021). *Spice*. <https://dedalvs.com/work/dune/misc/spice.pdf> (Last accessed 30.04.2026)

4.3.2. Phonology and Morphology

Orthographic Form	Romanized Form(s)	Phonetic Form(s)
	<i>A, a, —</i>	[a]
	<i>Aa, aa</i>	[a:]
	<i>Ai, ai</i>	[ai]
	<i>E, e</i>	[e]
	<i>Au, au</i>	[au]
	<i>O, o</i>	[o]
	<i>I, i</i>	[i]
	<i>Ii, ii</i>	[i:]
	<i>Ya, ya</i>	[ja]
	<i>Yu, yu</i>	[ju]
	<i>U, u</i>	[u]
	<i>Uu, uu</i>	[u:]
	<i>Wa, wa</i>	[wa]
	<i>Wi, wi</i>	[wi]
	<i>'</i>	[?]

Table 14. Neo-Chakobsa vowels (Peterson, 2021: 4).⁶²

b	ch	d	dh	f	g	h	j
[b]	[tʃ]	[d]	[dʰ]	[f]	[g]	[h]	[tʃ]
k	l	m	n	q	r	s	sh
[k]	[l]	[m]	[n]	[q]	[r]	[s]	[ʃ]
t	th	v	y	z			
[t]	[θ]	[v]	[j]	[z]			

Table 15. Neo-Chakobsa consonants.⁶³

ba	baa	bai	be	bau	bo	bi	bii
bya	byu	bu	buu	bwa	bwi	b	

Table 16. An example of a Consonant-Vowel combination with *b* /b/.⁶⁴

⁶² https://dedalvs.com/work/dune/misc/chakobsa_orthography_v6.pdf (Last accessed 30.04.2026)

⁶³ Table taken from: <https://www.omniglot.com/conscripts/chakobsa.htm> (Last accessed 30.04.2026)

⁶⁴ Table taken from: <https://www.omniglot.com/conscripts/chakobsa.htm> (Last accessed 30.04.2026)

A frequent phonological feature of Neo-Chakobsa is consonant gemination. In doubled consonants, more time is taken to pronounce the phrase. In the case of digraphs such as /kh/, only the first letter is subject to gemination, creating /kkh/ (Peterson, 2021: 3).

4.3.2.2. Morphology

Personal pronouns in Neo-Chakobsa are morphologically inflected according to person, number, and grammatical role. The language distinguishes between independent and dependent pronouns, as well as object forms that vary depending on their syntactic position within the clause.

	Independent	Dependent	Object	
			Non-Final	Final
First Person Singular	၁ <i>ne</i>	၁ <i>-yi/-ii</i>	၁ <i>-ni</i>	၁ <i>-nii</i>
Second Person Sg.	၂ <i>she</i>	၂ <i>-(a)sh</i>	၂ <i>-sha</i>	၂ <i>-shii</i>
Third Person Singular	၃ <i>ho</i>	၃ <i>-(a)ha</i>	၃ <i>-la</i>	၃ <i>-ho</i>
First Person Plural	၄ <i>mem</i>	၄ <i>-(i)m</i>	၄ <i>-ma</i>	
Second/Third Plural	၅ <i>kaah</i>	၅ <i>-(a)k</i>	၅ <i>-ga</i>	၅ <i>-kaa</i>
Relative Singular	၆ <i>bit</i>	၆ <i>-bit</i>	၆ <i>-bi</i>	၆ <i>-bit</i>
Relative Plural	၇ <i>bet</i>	၇ <i>-bet</i>	၇ <i>-ba</i>	၇ <i>-bet</i>

* The second /third person plural is also used for generic interpretations.

Table 17. Neo-Chakobsa personal pronouns (Peterson, 2024: 9).

Neo-Chakobsa nouns have six cases. These are nominative, accusative, genitive, locative, allative, and ablative. Nouns in the nominative case are usually unmarked. The genitive case is marked with *-a*, the locative with the prefix *un-*, the allative with *a-*, and the ablative with *is-*. Accusative forms often involve vowel reduction or stem modification (Peterson, 2024).

ᐅᐃ kwadi “son”, ᐅᐃᐃ kwadif “grandson”

C-Initial Stem	Unmodified		Modified	
	Singular	Plural	Singular	Plural
Nominative	ᐅᐃ <i>kwadi</i>	ᐅᐃᐃ <i>kaudi</i>	ᐅᐃᐃᐃ <i>kwadif</i>	ᐅᐃᐃᐃᐃ <i>kaudif</i>
Accusative	ᐅᐃᐃ <i>kwad</i>	ᐅᐃᐃᐃ <i>kod</i>	ᐅᐃᐃᐃᐃ <i>kwatfa</i>	ᐅᐃᐃᐃᐃᐃ <i>kotfa</i>
Genitive	ᐅᐃᐃᐃ <i>kwada</i>	ᐅᐃᐃᐃᐃ <i>kauda</i>	ᐅᐃᐃᐃᐃᐃ <i>kwadaf</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>kaudaf</i>
Locative	ᐅᐃᐃᐃᐃ <i>un-kwadi</i>	ᐅᐃᐃᐃᐃᐃ <i>un-kaudi</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>un-kwadif</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>un-kaudif</i>
Allative	ᐅᐃᐃᐃᐃ <i>a-kwad</i>	ᐅᐃᐃᐃᐃᐃ <i>a-kod</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>a-kwatfa</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>a-kotfa</i>
Ablative	ᐅᐃᐃᐃᐃᐃ <i>is-kwada</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>is-kauda</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>is-kwadaf</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃ <i>is-kaudaf</i>

Table 18. Inflection of nouns *kwadi* ‘son’ and *kwadif* ‘grandson’ in Neo-Chakobsa (Peterson, 2024: 10).

ᐅᐃᐃ shuna “to sleep”, ᐅᐃᐃᐃ nakala “to measure”

Standard	Unmodified		Modified	
	Imperfect	Perfect	Imperfect	Perfect
1st Singular	ᐅᐃᐃᐃ <i>shunii</i>	ᐅᐃᐃᐃᐃ <i>shunnii</i>	ᐅᐃᐃᐃᐃ <i>nakaalii</i>	ᐅᐃᐃᐃᐃ <i>naklii</i>
2nd Singular	ᐅᐃᐃᐃᐃ <i>shunaash</i>	ᐅᐃᐃᐃᐃᐃ <i>shunnasha</i>	ᐅᐃᐃᐃᐃᐃ <i>nakaalash</i>	ᐅᐃᐃᐃᐃᐃ <i>naklasha</i>
3rd Singular	ᐅᐃᐃᐃᐃᐃ <i>shunaaha</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>shunnaha</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>nakaalaha</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>naklaha</i>
1st Plural	ᐅᐃᐃᐃᐃᐃ <i>shuniim</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>shunnimi</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>nakaalim</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>naklimi</i>
2nd/3rd Plural	ᐅᐃᐃᐃᐃᐃ <i>shunaak</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>shunnaka</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>nakaalak</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>naklaka</i>
Rel. Singular	ᐅᐃᐃᐃᐃᐃᐃ <i>shunaabit</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃ <i>shunnabit</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃ <i>nakaalabit</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃ <i>naklabit</i>
Rel. Plural	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>shunaabet</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃᐃ <i>shunnabet</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃᐃ <i>nakaalabet</i>	ᐅᐃᐃᐃᐃᐃᐃᐃᐃᐃ <i>naklabet</i>
Infinitive	ᐅᐃᐃᐃ <i>shuna</i>	ᐅᐃᐃᐃᐃᐃᐃ <i>shunnaha</i>	ᐅᐃᐃᐃᐃᐃ <i>nakala</i>	ᐅᐃᐃᐃᐃᐃᐃᐃ <i>naklaha</i>
Imperative	ᐅᐃᐃᐃᐃ <i>shuna</i>		ᐅᐃᐃᐃᐃᐃᐃ <i>nakla</i>	

Table 19. Inflection of verbs *shuna* ‘to sleep’ and *nakala* ‘to measure’ in Neo-Chakobsa. (Peterson, 2024: 10)

4.3.3. Lexicon

The lexicon of Neo-Chakobsa is formed through root-based elements that create word/derivational families. Words are derived from a common root, and the derivational process is realized largely through suffixation. For example, the word *lefiiyi* ‘safe’ can take the suffixes *-iir*, *-ai*, and *-aiz*, which would create derived forms such as *leh-iz* ‘guardian’ and *leh-aiz* ‘very safe’, which are contextually modified variants of the base meaning.⁶⁵ According to Popovich & Bortnikov (2025: 120), Chakobsa consists of about 10000–15000 lexemes and has a vocabulary size of 700 words. However, in Villeneuve’s movie adaptation of the novel, only few of these words were utilized.

Of the glossary-sized Fremen lexicon of words borrowed from Arabic in Herbert’s *Dune*, the film only uses a handful: Mahdi, Lisan al-Gaib, the eyes of the Ibad, Shai-hulud, and Sayyadina. Since a cinematic adaptation is limited by screen time, a certain economy of filmic narrative dictates the writing of a screenplay that is more condensed than the source text. Reductive choices need to be made, and in the case of *Dune*, only the names deemed most crucial to Paul’s journey of becoming are kept (Dridi, 2022: 61).

4.3.4. Syntax

The dominant constituent order of Neo-Chakobsa is VSO (Verb-Subject-Object), which is a relatively uncommon order for world languages.⁶⁶ However, it occasionally follows SVO order as well.⁶⁷ Neo-Chakobsa can produce declarative, interrogative, imperative, and exclamatory types of sentences (Popovich & Bortnikov, 2025: 121). The following examples demonstrate different types of sentences and both types of constituent orders (VSO, SVO) used in Neo-Chakobsa.⁶⁸

Declarative

(+) *Bellaha thani Jamas jisne thanath, thedem amhadh, hi suunzaad o qelsshoq akkaarcha ekkera.* ‘Jamis’s body yields thirty-three liters and seven drachms of water.’

(-) *Ho so sahiim laiksat oziiyag.* ‘He’s not like the other strangers.’

⁶⁵ https://dedalvs.com/work/dune-part-two/misc/dictionary_sample.png

⁶⁶ <https://wals.info/chapter/81> (Last accessed 20.05.2026)

⁶⁷ As observed in: https://dedalvs.com/work/dune-part-two/master_dune2_dialogue.pdf

⁶⁸ Examples taken from: https://dedalvs.com/work/dune-part-two/master_dune2_dialogue.pdf

Interrogative

(+) *Ru-che kaah zih?* ‘For-what they here?’

(-) *So vii ru Shaya Huluud leda Mahda hu huraaha?* ‘Not is-it will Shai-Hulud know Mahdi when he-comes?/Will not Shai-Hulud know the Mahdi when he comes?’

Imperative

Nazdhanii ekkercha Ekkera Eddema. ‘Bring me a drop of Water of Life.’

Exclamatory

So nifriha sayadha un-reshim! ‘She is not fit for the desert!’

VSO

Qaubaka kaalik akaa riihurayi.

‘Warned (they) mothers (your) you about my-coming.’

SVO

Nazgahaho. Jahhufha Vizdhik Ezlii a-ker!

‘She did it. She changed (the) Poison Holy into-water!’

Negation in Neo-Chakobsa is achieved through *so*.⁶⁹

So unaarashii fadil zih. ‘**Not** is-for-you peace here.’ Meaning “You’re not welcome here.”

Ho so Mahdi! ‘He (is) **no** Mahdi!’

4.4. Language, ideology, and social organization in Dune

The previous chapter described the structural organization of the Neo-Chakobsa language of the Fremen. However, the purpose of Neo-Chakobsa is not just to contribute aesthetically to story world-building. It also acts as a marker of belonging. In Arrakis, Fremen are distinguished by their language, and it is important to speak the language to be accepted into Fremen society. When Stilgar was debating with other elderly Fremen as to whether they should accept Paul or not, he made such a remark:

⁶⁹ Examples shared by the creator David J. Peterson: https://dedalvs.com/work/dune-part-two/master_dune2_dialogue.pdf

Stilgar: *Heshkii shyadhza. [...] Vzdahaha Jamsa o zanla vejii. Jaraagaha sa kyurhum. Hajaagaha nichii geftham.*⁷⁰ ‘I saw the signs. [...] He killed Jamis in a fair fight. He speaks our language. He will quickly learn our ways.’ (Minutes 00.16.14–00.16.40 in *Dune: Part Two* (2024)).

Here, Stilgar implies that Paul’s speaking their language lessens his identity as an outsider. The rest of Stilgar’s statement, “He will quickly learn our ways”, presents language, culture, and therefore the practices of a society as intertwined. As Paul becomes more integrated into Fremen culture, his character shifts from that of an heir to a leader. Throughout the two *Dune* movies, Paul took several names that also appeared in Herbert’s novels (*Dune* (1965), *Dune Messiah* (1969)), namely, *Lisan al-Gaib*, *Mahdi*, *Muad’Dib*, and *Usul*. *Lisan al-Gaib* is a word derived from the Arabic *lisan* ‘language/voice’ and *Gaib* ‘unknown’, referring to a messianic being whose coming is set by the prophecy. *Mahdi*, similarly, means a messenger who guides, specifically, one who is guided by God and guides accordingly (Noletto, 2024: 105). These names were attributed to Paul by the Fremen since they believed he was the prophet they had been waiting for. *Usul* is explained as “base of the pillar” in *Dune: Part Two* (2024) (minutes 00.41.58–00.42.24). It means foundation or fundamental principle/way. *Muad’ib*, on the other hand, is the only name Paul chose for himself. It is the name of a clever desert mouse that is known for its survival skills in the desert, but it is also the constellation that points the North Star, therefore characterized as “The one who points the way” by Stilgar (minutes 00.42.58–00.43.03 in *Dune: Part Two* (2024)). Each of these names carries ideological significance through language. They assigned Paul different social roles within the Fremen. Kennedy (2016: 105) explains Paul’s transformation as such:

Paul’s choice of *Muad’Dib* as his name among the Fremen signals his transition into a position of strength and leadership. [...] Through the use of names, Herbert shows Paul’s morphing from a boy to a leader and a fighter, someone whose name connotes ferocity and fanatic loyalty.

Even though he did not believe the prophecy, Paul eventually took up the figure of the Messiah and used the language to lead the Fremen. A notable moment in *Dune: Part Two* (2024) is when Paul addresses the Fremen, speaking Chakobsa and using it as a persuasive device. Throughout

⁷⁰ Taken from: Villeneuve, D., & Spaihts, J. (2022). *Dune: Part Two* [Screenplay]. p.13
<https://s3.documentcloud.org/documents/25452663/dune-part-two-read-the-screenplay.pdf>

the speech, Paul attempts to convince the Fremen that he is the messiah mentioned in the prophecy.

Paul: *Unara sot un-taufih zihinifribit qummunii. Qaubaka kaalik akaa riipurayi. Jaha ish. [...] Shi ho Chausij? Shi zihik ishitammashabit o eddemash hiili. [...] E Rudhi Dina, heshidhanii: neLisaan al-Gayib. Ruyi dimalaruk a-SHIDHGIM.*

‘There is no one in this room who can stand against me. Your mothers warned you about my coming. Fear the moment. [...] What if I could be the one? This could be the moment you’ve been praying for, all your life. [...] The hand of God be my witness; I am the Voice from the Outer World. I will lead you to PARADISE.’⁷¹

At this moment, Paul’s linguistic competence in Chakobsa grants him credibility among the tribe and allows him to present himself not as an outsider but as one of them, and ultimately as their messiah. Furthermore, his speech relies heavily on religious expressions such as “The hand of God be my witness”, “Voice from the Outer World”, and “I will lead you to paradise.” Paul uses these expressions to activate pre-existing Fremen belief of the *Lisan al-Gaib* prophecy and strengthen his ethos within the community. While learning the language granted Paul access to Fremen society, he also had to adopt titles that carry years of social and religious expectations and transform through them. As Kennedy (2016: 104) asserts, “Paul’s multiple names are a powerful reflection of his changing attitudes and roles within Fremen society, and the extent to which he is willing to “go native” in order to achieve power.”

The examples above demonstrate that the language of Fremen is closely connected to social organization within their society, and that linguistic competence is associated with belonging. Paul’s incremental assimilation and acceptance among the Fremen took place simultaneously with his increasing use of Chakobsa and the adoption of names that carry religious and ideological significance within Fremen culture. Through language, Paul is transformed from an outsider into a prophetic and a warrior figure. In this sense, Neo-Chakobsa is more than an artificial language designed for aesthetic world-building. It is a means through which Fremen values are expressed and maintained. Terms such as *Lisan al-Gaib*, *Mahdi*, *Muad’Dib*, and *Usul* do more than merely identify Paul. They linguistically construct the social roles he fills within the community. Consequently, as Neo-Chakobsa is associated with Fremen

⁷¹ Taken from: Villeneuve, D., & Spaihts, J. (2022). *Dune: Part Two* [Screenplay]. p. 100
<https://s3.documentcloud.org/documents/25452663/dune-part-two-read-the-screenplay.pdf>

perception of religion and survival, it can also be examined through the lens of linguistic relativity and the relationship between language, culture, and the worldview.

4.5. Cultural elements in Neo-Chakobsa and implications for Whorfianism in Dune

Neo-Chakobsa reflects aspects that are significant for the Fremen: religion and environmental struggle in Arrakis. Many Neo-Chakobsa terms and expressions are directly associated with desert survival and prophecy. Therefore, the language represents the values and beliefs that structure Fremen society. The following examples illustrate how cultural and environmental elements are embedded within Neo-Chakobsa's vocabulary and idiomatic expressions.

Neo-Chakobsa word	Meaning	Cultural reflection
<i>Shai-hulud</i>	Eternal Thing/Name of the giant sandworms that produce spice. Only Fremen are able to tame it. (Noletto, 2024: 108)	" <i>Shai-Hulud</i> is not just the name of a sandworm, but also a symbol of strength, danger, and respect for nature. The Fremen see sandworms not only as a threat, but as a part of an ecosystem that they must coexist with" (Popovich & Bortnikov, 2025: 121).
<i>Ibad</i>	Blue eyes of the Fremen due to exposure to spice.	The blue eyes are caused by the Fremen diet, which relies heavily on spice and symbolize the Fremen's adaptation to Arrakis. They are a visible marker of identity and connection to the desert environment (Noletto, 2024).
<i>Lisan al-Gaib</i>	Voice from the other world/Messenger	The messiah expected by the Fremen to save and lead them to paradise.
<i>Sayyadina</i>	Fremen woman priest	The term reflects the crucial religious and spiritual role of women within Fremen society. Sayyadinas preserve sacred knowledge and maintain cultural continuity across generations.

Table 20. Neo-Chakobsa words that reflect the Fremen culture.

Neo-Chakobsa expressions	Meaning	Cultural reflection
<i>Zaihaash lek</i> ⁷² ‘You are drinking sand/You are crazy.’	Being crazy, madness. ⁷³	In the hostile desert ecology of Arrakis, sand brings danger and death while water represents survival. The idiom, therefore, emphasizes the irrationality of consuming a life-threatening substance. It is an instance of how environmental conditions shape metaphorical expressions in Chakobsa.
<i>O veyz shiidhaga</i> . ⁷⁴ ‘The spice must flow.’	The continuation of spice production and movement.	The expression illustrates the economic and ecological centrality of spice within Fremen society and the wider Imperium. Spice is not merely a resource, but a fundamental element for survival and power on Arrakis.
May thy knife chip and shatter. ⁷⁵	A ritualized expression of hostility/curse.	A reflection of the centrality of sacred blades (Crysknives) in Fremen culture and the importance of weaponry and combat. As crysknives are sacred objects for the Fremen, wishing for one to “chip and shatter” is a severe insult and curse. Thus, the expression reveals

⁷² Taken from: Villeneuve, D., & Spaihts, J. (2022). *Dune: Part Two* [Screenplay]. p. 93

<https://s3.documentcloud.org/documents/25452663/dune-part-two-read-the-screenplay.pdf>

⁷³ Explained by the director Villeneuve starting at 7.30: <https://www.youtube.com/watch?v=yNE8hIPscys> (Last accessed 07.05.2026)

⁷⁴ Provided by the creator David J. Peterson: <https://dedalvs.com/work/dune/misc/spice.pdf>

⁷⁵ Uttered in English, Chakobsa translation not available. Appeared first in *Dune* (2021) in minutes 02.21.36 used by Jamis before confronting Paul, later in *Dune: Part Two* (2024) in minutes 02.29.33 used by Paul before confronting Feyd-Rautha, his cousin and enemy.

		the cultural value attached to martial identity and survival.
<i>Chuka lek</i> ‘Break sand.’ ⁷⁶	To reveal oneself.	Disturbing the sand can expose one’s presence and trigger sandworms in Arrakis. “Breaking sand”, therefore, metaphorically signifies revealing oneself. The expression reflects the Fremen association between movement in the desert and visibility.

Table 21. Neo-Chakobsa expressions that reflect the Fremen culture.



Image 23. *Shai-hulud* sandworms in *Dune*.⁷⁷

As observed in the examples, some Neo-Chakobsa features are a reflection of the inhospitable desert environment as well as Fremen beliefs and social practices. Terms such as *Shai-hulud* are not limited to naming and represent the vicious ecosystem of the desert as well. As discussed previously, the language and culture interaction, where the landscape adds to the vocabulary, contributes to how speakers conceptualize and engage with the world around them. For Paul, the acquisition of Chakobsa can be realized as a contributing factor in his character shift as it provided him with the conceptual categories, such as *Lisan al-Gaib*, necessary for him to inhabit his new role. For Paul to survive the desert, first, he had to *think* like the desert (Vereb, 2023), which Chakobsa guided him to do. Surely, Paul’s transformation is not caused solely by learning

⁷⁶ E.g: *So chukkuha Lisan al-Gayib lek!* ‘Not he-has-broken Lisan al-Gaib sand!/The Lisan al-Gaib has not shown his face yet!’. Taken from: https://dedalvs.com/work/dune-part-two/master_dune2_dialogue.pdf

⁷⁷ Picture taken from: <https://www.popsoci.com/science/the-science-of-dunes-magnificent-merciless-sandworms/>

Chakobsa; however, it can be observed that linguistic immersion facilitated his adoption of Fremen values, social roles, and habits of thought through the interaction between language and culture. As the director Villeneuve explained, “The deeper he (Paul) goes into the desert, the deeper the movie becomes introspective. And this new landscape, and from that landscape this new culture that he would meet will transform himself.”⁷⁸

In line with the weak version of linguistic relativity, the movie can be perceived as a tacit portrayal of the interweaving of language, culture, as well as landscape to deploy a specific interpretation of the environment. Ryding (2021: 112) argues that in the *Dune* novels, Herbert’s naming strategy displays an understanding of the Sapir-Whorf hypothesis in line with the names’ reflection of the environment through language:

SWH theorised that people’s worldview is conditioned by the structure of their language and (to some extent) vice-versa; that there is a structural interface between language, culture, and thought. [...] A close colleague of Herbert’s, author Jack Vance, vividly illustrated the language/culture algorithm in his 1956 science-fiction book, *The Languages of Pao*, where different languages are used to train selected cadres of youth for different skills, character, and outlook. [...] Similarly, Herbert interwove language with landscape to deploy the reader’s wider interpretation of time, art, social distance, and future culture. The names of the *Dune* characters are a key element of the narrative that reflect and amplify the nature of the desert environment.

As the related vocabulary and, therefore, the naming is preserved in the movies, it is possible to apply this understanding to the screen as well. On the other hand, one possible issue with the movie adaptations of *Dune* is that even though the naming strategy was kept the same and the main vocabulary was maintained in the movies, Neo-Chakobsa expressions had one-to-one subtitle translations only, with no context, and the absence of the vocabulary that was uttered by the speakers (Ryding, 2021).

Nevertheless, Paul’s transformation throughout the two movies still reflects the interaction between language and worldview. The more Paul gradually acquires Chakobsa and integrates into Fremen society, the more he also adopts culturally specific ways of understanding the desert. For one thing, Fremen are deeply interconnected with nature and have

⁷⁸ Denis Villeneuve on following Paul’s transformation starting at “Creating the Camera Language” section <https://youtu.be/d61KTWkDdgI?si=g63pVgyEwDnjVuaE&t=179> (Last accessed 27.05.2026)

grown to learn how to live in harmony with it. Unlike the Harkonnens, who try to dominate the desert, Fremen live in equilibrium with their environment. Once he learnt the Fremen ways and language, Paul underwent a transformation that placed him in a position to perceive the world the way Fremen did. Vereb (2023: 72) explains the emergence point of Paul's transformation as such:

Paul slowly comes to grasp the Fremen ecological wisdom: "Muad'Dib tells us in 'A Time of Reflection' that his first collisions with Arrakeen necessities were the true beginnings of his education. He learned then how to pole the sand for its weather, learned the language of the wind's needles." For Paul to become *ecologically* wise, he had to change his own self conception, to see himself embedded in a larger world, and to develop wider sympathies.

Paul's earned familiarity and awareness with Fremen terminology and symbolism ultimately helped him to reinterpret himself through concepts that were already a part of Fremen culture, especially those associated with prophecy and messianic leadership. Names such as *Lisan al-Gaib* and *Mahdi* were not solely titles attributed to Paul. They also placed him within an already existing ideological and religious frame through which the Fremen perceive reality. Fremen lexicon reflects a way of life that is shaped by the struggle for survival in harsh desert conditions. As Paul immersed himself in this linguistic system, Arrakis was no longer just a hostile foreign planet, but also a living environment for Paul. Eventually, the values and ecological awareness embedded within the Fremen language were also accessible to Paul partly as a result of his internalization of the Chakobsa language. Kennedy (2016: 106) illustrates this transformation:

[...] Paul Atreides is fundamentally altered by his experience becoming Paul Muad'Dib, just as Jessica is significantly changed by her experience becoming Sayyadina and then Reverend Mother to the Fremen. Their identities as Atreides can no longer be separated from their identities as Fremen, and so they occupy a hybrid position where their attitudes, behaviors, and worldview are a combination of their previous training and beliefs and those of the Fremen community.

Accordingly, Paul's transformation is observed to be gradual and socially conditioned. Thus, while there is no literal transformation of Paul's cognitive function or worldview by using Chakobsa, learning it was a facilitator for him to adopt the Fremen mindset. Once Paul was

immersed in the Fremen culture and consequently acquired Chakobsa, he came to conceptualize the world with a perception that is confined to Fremen. Ryding (2021:120–121) elucidates the Neo-Whorfian stance and conceptualization in Herbert’s novels thusly:

Herbert’s constructed identities, viewed through the prism of cognitive neo-Whorfian linguistics, exemplify the theory that “language facilitates our conceptualization capacity” (Evans & Green 2006: 98) and that it “not only *reflects* conceptual structure, but can also *give rise to* conceptualization” (Evans & Green 2006: 101; italics in original). Grounded in their desert landscape, proper nouns help to lift the reader’s imagination into another world.

As specified previously, the same pattern can be encountered in Villeneuve’s adaptation of the *Dune* series to the screen since the main elements are pristine. In the movies, Neo-Chakobsa is intertwined with the desert landscape and the Fremen religious traditions. In this way, Neo-Chakobsa demonstrates an instance of how constructed languages can serve beyond aesthetic purposes and become instruments of world-building. Consequently, Paul’s linguistic immersion into Fremen society provides a sense of perspective for *Dune* adaptations to be interpreted through a weaker understanding of linguistic relativity, in which language directs attention to culture-specific concepts.

5. Conclusions

The main purpose of the present thesis was to examine the three selected contemporary movies *Arrival* (2016), *Avatar* (2009, 2022), and *Dune* (2021, 2024) through the lens of linguistic relativity. Throughout the study, the role of language in shaping perception and worldview within contemporary cinematic narratives was examined. Even though the selected movies adopted different interpretations and representations of the previously discussed Sapir-Whorf hypothesis, recurring patterns have been observed across them.

Firstly, in each of the three movies, language was presented as a transformative and shaping tool for the protagonists. In *Arrival*, the language was the main inducer for Louise’s alteration of time perception. As she interacted with the heptapods and acquired their language, she began to perceive time the way heptapods do, that is, nonlinearly. Accordingly, *Arrival* was observed to represent the strong version of the Sapir-Whorf hypothesis in which the language in use determines the speaker’s perception. On the other hand, even though they present examples of weaker linguistic relativity, the *Avatar* and *Dune* series were also observed to display the transformative role of language as well. Throughout the *Avatar* series, Jake

transforms from a soldier to a person who eventually becomes capable of leading a symbiotic life with nature. The concepts that were once alien to Jake, such as the flow of energy and the goddess Eywa, became central to his life with the help of language and, relatedly, the culture of the people (Lambert, 2023). Similarly, in the *Dune* series, Paul's transformation to a leader was supported by his acquisition of Chakobsa as well as his integration into the Fremen culture, as noted by the director Denis Villeneuve. In *Avatar* and the *Dune* series, even though the language was not the sole reason for the protagonists' transformation and no causal relationship was observed, it nevertheless played a role in shaping their perception and perspectives. In the *Avatar* series, Jake, who initially approached Pandora from a human and military-oriented perspective, came to view nature as an interconnected living system in which all beings are linked through Eywa. Similarly, in the *Dune* series, Paul was able to move beyond his position as an outsider and begin to perceive the desert not merely as a hostile environment but as a sacred space that is central to Fremen identity. In both cases, the acquisition of language is observed to have facilitated a deeper engagement with the beliefs and values of the communities. On the grounds of this facilitation, the protagonists were able to reinterpret their identities and environments through new perspectives. A distinction in the presentation of the Sapir-Whorf hypothesis exists among *Arrival*, *Avatar*, and the *Dune* series. Whereas *Arrival* displays the strong version of the Sapir-Whorf hypothesis, neither in *Avatar* nor in the *Dune* series does language directly determine the worldview and perception as proposed by the strong interpretation of the Sapir-Whorf hypothesis. Rather, it is displayed as a part of one of the several interconnected cultural mechanisms that influence how one interprets reality. Thereby, it is reasonable to interpret both *Avatar* and the *Dune* series as productions reflecting the principles of *Neo-Whorfianism*.

Secondly, across the three films, language was displayed as an inseparable component of the culture. In *Arrival*, when Louise was trying to interact with the heptapods, a moment of chaos occurred when one of the heptapods produced the phrase *offer weapon*, and it was misinterpreted by the military authorities. Louise, however, later explained that it could be a culture-specific expression that they were simply not capable of comprehending since they did not have access to the language of the heptapods at that time. A similar pattern can be observed in the *Avatar* and *Dune* series as well. In *Avatar*, Jake initially couldn't even comprehend the basic greeting *Oel ngati kameie* 'I see you.' As he integrated into the Na'vi society and culture, he gradually internalized the broader meaning of the phrase, which encompasses the recognition of the person on a deeper spiritual level rather than mere visual perception. Likewise, in *Dune*, learning Chakobsa allowed Paul to interact with cultural concepts and social practices that are

peculiar to the Fremen. Through the combined knowledge of Fremen language and culture, he gained access not only to the act of communication but also to the symbolic systems and collective identity of the Fremen community.

Third and lastly, the protagonists of the three movies needed to learn and eventually acquire the target language to be accepted and acknowledged in the social context. In *Arrival*, it was only when Louise started to first imitate, later speak the Heptapod language that the heptapods accepted and agreed to communicate with her. Similarly in *Avatar*, Jake, who was once a man who couldn't even utter the basic Na'vi greetings properly, became the chief of the Omatikaya clan thanks to the power he incrementally gained from integrating into the Na'vi culture and eventually speaking the Na'vi language. In *Dune*, Paul needed to prove himself to the Fremen as *the one*. The fact that Paul spoke Chakobsa was Stilgar's, Paul's biggest supporter, primary rationale for him to be accepted into the Fremen society.

When taken together, the above-mentioned observations point out to the fact that across the three movies that were analysed, there exists a connection between language and systems of meanings that have an impact on the way individuals perceive and conceptualize the world as well as shape their identities. While *Arrival*, *Avatar*, and *Dune* represent the different dimensions of the linguistic relativity hypothesis, they demonstrate that language plays a role in interpreting the world and shaping people's relationship with the environment.

While these observations offer insights into cinematic representations of linguistic relativity, several limitations of the present thesis should be acknowledged. Firstly, the qualitative nature of the present analysis inevitably involves a degree of subjective interpretation; therefore, the same data can be interpreted differently, and alternative readings remain possible across audiences. Secondly, the study is limited to three movies only. It does not represent contemporary cinema holistically, nor does it claim to do so. Finally, the focus of the study is on fictional representations of language rather than empirical evidence concerning linguistic relativity. The findings should therefore be read as indicative of cultural and cinematic engagements, rather than evidence for specific linguistic theories.

However, these limitations could be the basis of future studies. First, the dataset can be extended with the inclusion of films from non-Western cinema to observe if the effect of linguistic relativity emerges in different cultural settings as well. Moving beyond qualitative analysis is another step. Future research might employ quantitative methods, such as audience surveys, to map audience responses to cinematic representations. These directions could offer further information to bridge the current gap between the cinematic representation of linguistic theories and their reception by the public.

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