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Linguistic Creativity in Cinema: A Case Study of the Na'vi Language

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INDEX

INTRODUCTION.....	1
Chapter 1: AN OVERVIEW OF CONSTRUCTED LANGUAGES.....	3
1.1 Introduction to linguistic invention and terminology	3
1.2 Classification of invented languages	3
1.2.1 Invented languages based on their nature	3
1.2.2 Invented languages based on their purpose	4
1.3 Historical evolution of language invention.....	5
1.4 Invented languages for fiction.....	8
Chapter 2: THE GENESIS OF THE NA’VI LANGUAGE	15
2.1 Influences of the film’s setting and Na’vi culture on the language	15
2.1.1 The setting	15
2.1.2 Na’vi social and cultural system	16
2.1.3 Influence of the Na’vi culture on the language	17
2.2 The creative process behind the Na’vi language	20
2.2.1 James Cameron’s vision.....	20
2.2.2 Paul Frommer’s ideation	21
2.3 The success and the expansion of the language	24
CHAPTER 3: UNVEILING THE NA’VI LANGUAGE	27
3.1 Balancing realism and artistic purpose: designing a language for cinema	27
3.2 Realism in the cultural aspects of the language	28
3.3 Realism in the linguistic aspects of the language	29
3.3.1 Phonology	29
3.3.2 Morphology	37
3.3.3 Syntax	45
3.4 Application of Greenberg’s universals to Na’vi	47
CONCLUSION.....	51
BIBLIOGRAPHY.....	55
RIASSUNTO IN ITALIANO	59

*“Everything is backwards now,
like out there is the true world,
and in here is the dream”.*

Avatar, 2009.

INTRODUCTION

Creativity stands as one of the most fascinating characteristics of the human experience and can find expression through various artistic forms: music, painting, handcrafting, and so forth. However, in everyday life, creative art is rarely associated with a scientific aspect such as linguistics. Nevertheless, linguistic invention is an art and a more common and ancient hobby than one might think (Peterson, 2015: 25), sometimes even becoming the focus of children's games (Bausani, 1974: 25). The categories of linguistic invention are diverse and, as will be discerned throughout the paper, have followed and alternated over time (Bausani, 1974). With the advent of fantasy and science fiction genres, they have received an extra boost. In these fictional genres, linguistic imagination blends with fantastical settings and landscapes to create a unique, coherent, and captivating setting. In both literature and cinema, this translates into a profoundly immersive quality, extending to the point of envisioning a desired reality within fantastical worlds.

Throughout this study, the aspect of linguistic invention in fantasy and science fiction contexts will be discussed, with a primary focus on *Avatar* (2009) and the Na'vi language. Specifically, the objective of this study is to explore, through linguistic and cultural analysis, the “naturalness” and realism of the Na'vi language. To this end, the first chapter opens with a brief introduction to linguistic invention, followed by a historical overview of the development of various types of invented languages. This outline is supported by various examples, from *Bailabalan* to Esperanto and the search for a universal language (Bausani, 1974). The overview culminates in a more specific exploration of languages crafted for fictional works, beginning from '900 with Tolkien, up to the present day, with the internet being partially the reason of their success. The second chapter, on the other hand, aims to analyze the actual creative process of the

Na'vi language, based on interviews and webinars with its creator, Dr. Paul Frommer, as well as on the online Na'vi grammar available (Annis, 2010-2023). In particular, the examination of the process of creation focuses on the development of the sound system and on the fascinating methods of word-building in the Na'vi language. The linguistic development is complemented by a brief illustration of the setting of the Avatar film and of the Na'vi culture, which played a central role in the realization of the language. Besides these factors, a brief mention will go to the success that the language has gained, which allowed its expansion over the years.

Building upon the insights from the initial two chapters, it becomes evident that a language devised for artistic purposes must possess a degree of uniqueness while retaining elements that render it comprehensible to humans. The final chapter, therefore, based on these considerations, focuses on the concrete analysis of the Na'vi language in search of natural and realistic elements within the main linguistic categories: phonetics (explored in the second chapter), phonology, morphology, and syntax. The rules of the language in these categories are illustrated, alongside the various exceptions that characterize it. This analysis will allow to conclude at what level the Na'vi language deviates from the human and how much, instead, it approaches reality.

Chapter 1: AN OVERVIEW OF CONSTRUCTED LANGUAGES

1.1 Introduction to linguistic invention and terminology

The languages we speak every day are the result of a long historical process (Adams, 2011: 1) of development that has shaped them into the modern languages we know today. These languages are the result of a natural process; therefore, they are referred to as *natural languages* (Peterson, 2015: 26). Invented languages, on the other hand, are the result of a conscious process of human creation (Libert, 2018: 1) and are usually designed to fulfil a specific purpose (Adams, 2011: 3). They are more commonly known as *artificial languages*, although some argue that this definition is not appropriate, as it has negative implications and can be misleading, since a substantial portion of them incorporates elements from several natural languages (Libert, 2018: 1, 2). For this reason, they are also often referred to as *planned languages* or *constructed languages* (shortened to *conlangs*) (Libert, 2018: 2), as well as with other terms that vary according to their function. This aspect will be unraveled further throughout this chapter, with relevant illustrative examples.

1.2 Classification of invented languages

1.2.1 Invented languages based on their nature

The prevailing method of categorizing artificial languages is contingent upon the extent to which they draw from natural languages as their foundation. Languages that draw most of their elements from natural languages are called *a posteriori* languages (Libert: 2018: 1). Conversely, *a priori* languages are entirely independent of any natural language influence; they are conceived "*from scratch*", employing novel symbols, signs, or other elements crafted to convey fundamental concepts (Lo Bianco, 2004: 8).

Examples of both categories will be briefly examined in the upcoming sections.

1.2.2 Invented languages based on their purpose

Depending on their intended purpose, invented languages can be categorized into four main groups, which can be further divided into two main categories: languages designed for communication and languages created for artistic purposes (Bausani, 1974: 11). In the first category fall secret or special languages (Bausani, 1974), universal auxiliary languages (*a posteriori*), and philosophical languages (*a priori*). The second category includes artistic languages, which encompass fictional languages (Peterson, 2015: 29) and languages crafted purely for personal enjoyment and entertainment (Peterson, 2015: 23), “often described as linguistic art for art’s sake” (Destruel, 2016: 3). Examples of the latter category include the “markuska” language, created as a game by an Italian boy, E. J. (Bausani, 1974: 25) or Teonaht, created by Sally Caves (Peterson, 2015: 23), as well as many others (Peterson, 2015: 23).

One of the primary motivations behind the creation of invented languages is the pursuit of easier international communication, achieved through the development of the so-called “universal languages”, also known as international auxiliary languages or *IAL* (Lo Bianco, 2004: 14), with Volapük and Esperanto being the most prominent instances (Libert, 2018: 1). “Philosophical languages” (*a priori*) can be put on a similar level. Indeed, they are some sort of universal languages, but devised mainly because philosophers and scientists perceived shortcomings in existing languages that needed tackling (Peterson, 2015: 16). They are opposed to universal languages because the former serve a communicative purpose, requiring simplicity and ease of learning, whereas philosophical languages do not prioritize simplicity or learnability (Peterson, 2015: 16). Philosophical languages can fall into the category of “engineered languages”, which are “created to achieve some specific type of linguistic effect” (Peterson, 2015: 29). Specifically, they are created to pursue a scientific goal, such as testing a linguistic hypothesis or philosophy. For instance, some are created to test the Sapir-Whorf hypothesis to see “how an entirely different language would shape culture” (Destruel, 2016: 2).

Another intriguing category of invented languages includes “secret languages”, which were most prevalent in ancient times (Bausani, 1974), but are still widespread today, for example in Sardinia, Ethiopia or Central Asia (Bausani, 1974: 22). Today, they are largely associated with wordplay, although in Italian they may also refer to “occupational languages” (Bertinetto, 1987: 1). These languages are generated within a work-place environment, such as the mining context (Bausani, 1974: 55-56).

Lastly, the category of greatest interest for this study is that of “artistic languages”, which are languages created for fictional and artistic purposes (Peterson, 2015: 29), embracing the realms of fantasy or science fiction in literature and cinema. Among these, the most prominent examples are Klingon, J. R. R. Tolkien's languages (Lo Bianco, 2004: 11, 12), Dothraki from the *Game of Thrones* series (Peterson, 2015), and the Na'vi language from the *Avatar* films.

1.3 Historical evolution of language invention

To date, “*thousands of artificial languages have been created*” (Lo Bianco J., 2004: 8). Although the last two centuries have seen the most prolific period in terms of language creation, the concept of designing new languages emerged several centuries ago (Libert, 2018: 2). In his work *Le lingue inventate. Linguaggi artificiali, linguaggi segreti, linguaggi universali* (1974), Alessandro Bausani provides a clear and well-organized chronological account of language invention spanning centuries, from antiquity to the 20th century. As noted by the author, early instances of invented languages can be traced back to ancient civilizations and tribal communities. In these contexts, the concept of linguistic creativity was intimately intertwined with notions of religion, magic, and mythology (Bausani, 1974: 50-55). On one hand, these languages primarily served magical purposes, involving the formulation of mystical incantations. On the other hand, the act of linguistic creation was attributed to the divine, which meant that the human ability to generate words established a profound connection between humanity and the divine realm. An additional intriguing illustration of languages crafted in ancient times can be found in *pantang* languages, also known as *taboo* languages (Bausani, 1974: 55-59). These

languages were intricately linked to cultural taboos prevalent within their respective populations and were characterized by the creation of new vocabulary for referencing elements that, due to specific beliefs, could not be directly mentioned by their common names. The use of these linguistic creations was usually restricted to specific domains, primarily work-related contexts. Indeed, they were notably prevalent among fishing communities, hunters, miners, and similar groups (Bausani, 1974: 55-56). Both magical and taboo languages can be classified as *secret languages*, while another possible interpretation of this category recalls the languages devised within the settings of ancient secret societies (Bausani, 1974: 50-59).

The previously mentioned idea of connectivity between linguistic creation and divine power is repeatedly emphasized by Bausani in his work. It is particularly prevalent in the timeframe ranging from antiquity to the Middle Ages, when the sacred nature of languages emerges in the creation of wordplay (Bausani, 1974: 80). Among the most famous sacred linguistic games is the *Sator/Arepo/Tenet/Opera/Rotas*, dating back to the first century, where the letters of the *Pater Noster* formula are rearranged alphabetically (A, E, N, O, P, R, S, T) and correspond to numbers (from 1 to 8). The game involves substituting the numbers for the letters within a square, where the letters appear to be arranged in a scattered order. The result clearly indicates that it is a numerology evoking the sacred Trinity (Bausani, 1974: 80-81). Nonetheless, the most significant endeavor to “emulate the divine power” is exemplified by the *Bailabalan*, a sacred language devised within the Islamic world slightly after the Middle Ages (Bausani, 1974: 96). The importance of this creation is underscored by its distinction as the earliest constructed language within the educated world and the first instance of a collective language, as it incorporates vocabulary of Arabic, Turkish, and Persian origin (Bausani, 1974: 89-93).

During the era of Humanism, Latin flourished as the universal language of scholarship and sacred discourse. However, as it gradually waned over time, the need arose to seek an international or *universal* language, no longer sacred but rather generic (Bausani, 1974: 98). This necessity, spanning from the 17th to the 19th centuries, led to the proliferation of philosophical universal languages *a priori*, and later to the emergence of

universal auxiliary languages *a posteriori*, which enjoyed broader and more practical development than their predecessors (Bausani, 1974: 102). The reason behind their success lies in their aim to simplify existing languages for international communication (Bausani, 1974: 113). In contrast, philosophical languages *a priori* sought a different type of universality, which was more challenging to achieve and to apply in practical contexts (Peterson, 2015: 16-17). Nonetheless, there continued to be attempts at creating *a priori* languages in the 19th century, although with a reduced emphasis on a philosophical foundation. One of the most prominent examples can be recognized in the *Solresol* language, conceived by Jean-François Sudre, who chose to use musical notes as language symbols instead of linguistic signs, as musical notes possess a truly universal value. Consequently, the lexicon was derived from various combinations of these notes. In general, the language was highly appreciated for its originality and for being the first complete universal language (Bausani, 1974: 116-117).

Later, Volapük, created by the German priest Schleyer, became popular. It stands out as a fusion of both an *a posteriori* language and an *a priori* language, as it draws from the English language and other European languages, while introducing new grammatical rules, not adhering to any existing conventional rule (Bausani, 1974: 118). This distinct feature is evident in the very name of the language, which is derived from an alteration of the English words "vol" meaning "world," and "pük" from the English verb "speak", signifying "language." Considering that cases in this language are indicated by vowels, with *a* specifically denoting the genitive case (a derivation borrowed from Russian), "Vol-a pük" translates to "*language of the world*", hence universal (Bausani, 1974: 118-119). However, not long after, this language began to decline, and in its place emerged a universal language *a posteriori* that achieved even greater success: Esperanto, which continues to enjoy a fair amount of success to this day (Peterson, 1974: 17). Zamenhof, the inventor of this language (Bausani, 1974: 120) aimed for it to be simple and ideologically neutral (Destruel, 2016: 2). He had great hopes that the language could achieve international use, hence the very name of the language: Esperanto, from the pseudonym with which Zamenhof had first introduced the language, "Dr. Esperanto", meaning "Hopeful Doctor" (Bausani, 1974: 121).

Despite further attempts made subsequently (Bausani, 1974: 133-137), it is clear today, however, that any attempt to create a universal and international language from scratch has, in practice, been unsuccessful; to this day, English is the quintessential global language and *lingua franca* humanity had aspired to for centuries and it is not neutral or “easy” (Lo Bianco, 2004: 17).

Alongside the interest in international languages, in the 20th century there was a growing fascination towards invented languages for artistic purposes (Fimi, Higgins, 2017: 24), known as *artlangs* (Peterson, 2015: 29), which will be specifically discussed in the next paragraph.

1.4 Invented languages for fiction

Before delving into the realm of artlangs, it is essential to examine the concept of *world-building*, to which they are closely linked. Indeed, language invention has always been connected to building imaginary worlds, whether it was worlds created by children as a game (Fimi, Higgins, 2017: 22), which is the case of the previously mentioned “markuska” (Bausani, 1974), or the real world imagined to be connected through universal languages. The concept of *world-building*, specifically, represents the foundation of both contemporary and non-contemporary fantasy and science fiction realms. Languages play a fundamental role in this context: fictional languages have, in fact, been (and continue to be) used by various writers to complement the world-building of their fictional works (Fimi, Higgins, 2017: 22).

Artlangs or fictional languages emerged and gained prominence in the 20th century. However, there are examples of linguistic inventions in fiction literature dating back to the Middle Ages and Early Renaissance time (Fimi, Higgins, 2017: 22). Indeed, the science fiction and fantasy genres that are common today are the evolution of other literary genres that also “relied on constructing imaginary worlds” (Fimi, Higgins, 2017: 22), such as utopias and travelers' tales (Fimi, Higgins, 2017: 22). Two specific examples of these genres presenting language invention are Thomas More's *Utopia* (1516) and Jonathan Swift's *Gulliver's Travels* (1726). Thomas More invented the language of “Utopian”, “an

a posteriori language based on Latin, Greek, Italian and Persian” (Fimi, Higgins, 2017: 23). Swift, on the other hand, employed a common form of linguistic invention in fantasy: *naming* (Fimi, Higgins, 2017: 22). He created names for creatures and places in various languages, each spoken by the inhabitants of the worlds Gulliver visited during his travels. For instance, the language of the “*Houyhnhnms*”, a civilization of educated horses, which was based on onomatopoeia that evoked the neighing of horses (Fimi, Higgins, 2017: 23).

The proliferation of artlangs in the 20th century was influenced by a significant shift in linguistic and philological studies, particularly tied to the earlier discovery of linguistic families and the existence of an ancient "proto language" (Indo-European), that evolved into modern European languages over time (Fimi, Higgins, 2017: 24). In the context of this new linguistic approach a figure of the highest significance in the realm of fictional languages emerged: J. R. R. Tolkien, a writer and philologist who created a range of invented languages intricately tied to the world-building of his works (Fimi, Higgins, 2017: 24). In his case, however, he did not create languages that could enhance his world-building, he created fictional worlds and roles specifically to provide a space “to exist” for the languages he had previously invented (Lo Bianco, 2004: 12). Tolkien not only contributed to the development of linguistic invention for fiction, but was also the first to theorize this practice in his work *A Secret Vice* (1931). In his book he highlighted four specific qualities that all fictional languages are meant to possess: “*the creation of word forms that sound aesthetically pleasing [...]; a sense of fitness between word form and meaning [...]; the construction of elaborate grammars that very few previous inventors of fictional languages engaged with in such detail [...]; the intertwining of myth and language to create ‘an illusion of historicity’*” (Fimi, Higgins, 2017: 25). All these characteristics can be found in his own invented languages, especially in his two main works *The Hobbit* (1937) and *The Lord of the Rings* (1954-55). In general, his works and inventions have influenced creators of artlangs after him (Fimi, Higgins, 2017: 25). Subsequently, in the historical context of the two World Wars, the Cold War and political and social crisis, artlangs were used in the emerging genre of the dystopian fiction. For the creation of these languages authors of the time referred to the so-called “Sapir-

Whorf hypothesis”, thought of by linguists Edward Sapir and Benjamin Whorf, according to which “*the structure of the language influences the modes of thought of the culture in which it is spoken*” (Fimi, Higgins, 2017: 25). The authors of dystopian fictions applied this concept by crafting vocabularies for the invented languages in their works that mirrored the cultural context they depicted (Fimi, Higgins, 2017: 25). An example can be found in what is the world's most famous dystopian novel, George Orwell's *1984* (1949). Orwell created an *a posteriori* language called *Newspeak*, with the aim of portraying the political and psychological oppression imposed by the "Big Brother" in his imagined dystopian world (Fimi, Higgins, 2017:25). The language derived from English terms but with an entirely different morphology, characterized by regularized and predetermined compound words (e.g., *goodthink* stands for “orthodoxy”), eliminating the need for individuals to be active "thinkers" to use it. As a result of such morphology, there was a drastic reduction in the number of words in the language, which aligned with the goals of the political regime in the dystopian reality Orwell described: the Big Brother exercised complete control over the number of existing words and over their meanings (Adams, 2011: 52-53). For the creation of this language Orwell drew inspiration from the attempt to create the "Basic English" by the philologist C. K. Ogden, who tried to simplify English to 850 words (Fimi, Higgins, 2017: 25).

Starting from the late 20th century to the present day, the practice of hiring professional linguists to invent languages has become widespread among creators of various forms of fictional media, ranging from films and television series to video games (Fimi, Higgins, 2017: 26). The inaugural instance of someone being hired to create a language can be traced back to the development of the Paku language for *Land of the Lost* (1974), a task undertaken by Victoria Fromkin (Peterson, 2015: 19). Other famous examples are Klingon in *Star Trek*, invented by Marc Okrand, Galactic Basic and other languages spoken in *Star Wars*, Dothraki in the television series *Game of Thrones* (Fimi, Higgins, 2017: 26), crafted by David J. Peterson (Peterson, 2015), and Na’vi for the *Avatar* films, created by the linguist Paul Frommer (Fimi, Higgins, 2017: 26).

Apart from the Na’vi language, which will be discussed further on, Dothraki in the *Game of Thrones* series is one of the most recent examples of art languages that are deeply

connected to world-building (Fimi, Higgins, 2017: 27). Initially, the language was introduced by the author George R. R. Martin in his fantasy series *A Song of Ice and Fire*, but it consisted only of a few words and phrases, and the language was not fully developed. When the television adaptation was underway, linguist David J. Peterson was enlisted to create the language based on the words introduced by Martin. It is a language spoken by the population of the Hun-like, "a tribe of horse-riding warriors" (Fimi, Higgins, 2017: 27), who use the language solely for oral communication, therefore they do not have a writing system (Fimi, Higgins, 2017: 27). In this language, the Sapir-Whorf hypothesis is particularly evident. For instance, in the expression "Ana Dothrak Chek", which literally means "I ride well", but stands for the English equivalent of "I am fine". Expressions of this type vividly underscore the cultural importance of horses within the Dothraki tribe (Fimi, Higgins, 2017: 27). Peterson, however, didn't stop at creating the Dothraki language; he also crafted the languages of Casithan, Irathient, and Omech for the "post-apocalyptic science fiction show *Defiance* (2013-2015)" and the Shiväisith language for the Dark Elves in the film *Thor: The Dark World* (2013). Furthermore, he published a guidebook for creating constructed languages titled *The Art of Invented Languages* (2015), in which he aimed to provide future language creators (*conlangers*) with the steps to follow during the process of language creation, since there was no definitive guide available at the time, despite it being a more common practice than one might think (Peterson, 2015: 25). While discussing his own process of creation of the Dothraki language, he asserts that his objective in crafting the language was to create something that could endure over time, as he believed that *Game of Thrones* would become a timeless success (Peterson, 2015: 11). In addition, he underlines the importance of following a "goal-driven approach" (Peterson, 2015: 24) in language creation, which entails that the construction of languages should align with the purpose for which it is being created. Hence, a fictional language created for a realistic setting, even if in a fantastical context, should sound as authentic as it can (Peterson, 2015: 24). To put it more plainly, fictional languages should resemble natural languages because they are "real" in the fictional realms to which they belong (Destruel, 2016: 3). This mostly concerns the creation of complex grammatical structures, including exceptions

and peculiar linguistic features (Destruel, 2016: 3), or the development of a complete historical background for the languages, as in the case of Tolkien, who conceived a linguistic family for his creations (Peterson, 2015: 18). However, it is essential to differentiate this concept from the idea that languages for sci-fi settings should sound “alien” and unfamiliar to humans. Indeed, in the case of the Klingon language, the aim was to create a language entirely distinct from any existing and known human language, one that sounded as “alien” as possible, as it was intended to be spoken by the “Klingons”, a race of evil humanoid aliens (Adams, 2011: 112). It's also worth emphasizing, in this regard, that the anatomical features of the fictional speakers can exert a substantial influence on the sounds generated by the language, as explained by the conlanger Jessica Sams during an interview with Megan Condis (Condis, 2016: 156). Lastly, in his work, Peterson reflects briefly on the importance of how languages are spoken and pronounced by actors when it comes to invented languages for cinematic works. This is because, with the existence of the internet, there are many viewers who might notice any errors, as he had observed himself in the beginning scene of the Star Wars film *Return of the Jedi* (Peterson, 2015: 1-5). Years after spotting this mistake as a kid, he discovered that he was not the only one among the fans of the series, and that was thanks to the internet (Peterson, 2015: 5).

In this regard, it is interesting to notice that in the 1990s and early 2000s the proliferation of the internet began, which brought to the rise of online communities of enthusiasts for fictional languages. They started to learn and speak these languages as a hobby and interacted with each other on online Forums. Despite *Star Wars* being the biggest cinematic success of the 1980s, Klingon was the first language to become part of such a community (Fimi, Higgins: 2017: 26). Indeed, “according to the 2006 edition of the *Guinness Book of World Records*”, Klingon was recognized as the “world's largest fictional language” (Adams, 2011: 111). This aspect is fascinating because languages that were originally invented for fictional characters had evolved into something resembling real-world universal languages. They became “international” languages for groups of people passionate about the fantastical worlds these languages helped to construct in the first place (Fimi, Higgins, 2017: 26). This phenomenon has inspired many individuals to create

new languages as a form of private enjoyment (Fimi, Higgins, 2017: 26). Therefore, the internet can be regarded as a significant factor in the proliferation of "conlanging" as an activity and widespread interest.

As fascinating and extensive as the world of fictional languages may be, this topic will not be explored further. The next chapter will focus on the in-depth analysis of the creation of the Na'vi language, which has been only briefly mentioned so far.

Chapter 2: THE GENESIS OF THE NA'VI LANGUAGE

Na'vi is a fictional language created by Dr. Paul Frommer for the sci-fi film *Avatar* (2009), directed by James Cameron (Britannica, 2023). James Cameron is a renowned filmmaker and director, thanks to several of his famous works, including *Titanic* (1997), *Terminator* (1984), and the two *Avatar* films: *Avatar* (2009) and *Avatar: The Way of Water* (2022) (Britannica, 2023). Before delving into the explanation of the language creation process, it is essential to provide a concise overview of the film's setting to clarify the associated world-building. As established in the preceding chapter, the plot and background play a crucial role in shaping the language in works of fiction. During a webinar on the creation of the Na'vi language, Frommer himself emphasized his attention for the film's cultural and environmental aspects, which were functional to creating the language (2020).

2.1 Influences of the film's setting and Na'vi culture on the language

2.1.1 The setting

The story unfolds in a future, specifically in the year 2154 (Paliy, 2012: 2), where the human influence on nature has led to the degradation of their planet and loss of all its resources (Jeserich, 2010: 1). In the attempt to explore alternative solutions, supported by significant technological improvement (Jeserich, 2010: 1), humanity stumbles upon the existence of a planet, or more accurately a moon, named Pandora, situated 4.4 light-years from planet Earth (Wilhelm, Mathison, 2010: 3-5). Despite being a moon, as it orbits the planet Polyphemus in the Alpha Centauri system (Wilhelm, Mathison, 2010: 3), Pandora is essentially a fully inhabited planet. Geologically, it closely resembles Earth, but it possesses an atmosphere inhospitable to humans without the use of specific oxygen canisters known as *exopacks* (Wilhelm, Mathison, 2010: 8-12). Humans are drawn to Pandora due to a unique mineral with immensely high economic value on Earth: *unobtainium* (Wilhelm, Mathison, 2010: 4-5). They are willing to take extreme measures to colonize the planet and take possession of the precious resource, even at the cost of destroying a civilization – that of the Na'vi, the inhabitants of Pandora.

The film attempts to depict how humanity persistently adheres to a recurring pattern: much like the historical colonization of the world, it repeats this pattern in the future (Cameron, 2009), and fails to learn from its past mistakes. Particularly, it highlights the disruption of harmony with nature caused by mankind's relentless pursuit of power and technological progress (Jeserich, 2010: 1). As James Cameron emphasized in an interview (2021), the creation of the *Avatar* film was not only a way to combine his lifelong passion for fantasy and sci-fi, but also to explore the real-world relationship between humans and nature. This contrast becomes evident when comparing life on Earth, referred to as "the dying world" by the protagonist (Cameron, 2009), with life on Pandora, where its inhabitants share a profound spiritual connection with the environment.

2.1.2 Na'vi social and cultural system

The Na'vi are a population of three meters tall blue humanoids, with a Neolithic-type society (Wilhelm, Mathison, 2010: 26-27). "Na'vi" literally means "the People" (Miller, 2023: 18). They are divided into multiple clans, many residing in different regions of the planet, including the rainforest, swampy areas, mountainous regions, and more (Wilhelm, Mathison, 2010: 26). The 2009 film centres around the Omatikaya clan (Miller, 2023: 59), who live in the rainforest. Their home is a colossal tree called Hometree (*Kelutral* in Na'vi). The Hometree is filled with hammocks, which they personally weave and use as beds or as socializing spaces (Wilhelm, Mathison, 2010: 38). Unfortunately, their Hometree is situated above a deposit of unobtainium, similarly to other sacred sites for the Na'vi population (Wilhelm, Mathison, 2010: 34). The concept of sacredness is fundamental in this context because, to the Na'vi, unobtainium is not merely a material; it possesses a spiritual essence (Paliy, 2012: 2). "*Unobtainium is the substance which upkeep* (the bond between the spiritual and the material world)" (Paliy, 2012: 2). The entire cultural and spiritual system of the Na'vi is founded on a deep spiritual bond with nature, with every living creature, both plants and animals, as well as with Eywa, the divinity that "*encompasses it all*" (Wilhelm, Mathison, 2010: 25-27). As mentioned by

Paliy, in the film the female protagonist Neytiri “talks about a network of energy that flows through all living things” (*Avatar* in Paliy, 2012: 3). An essential aspect of their life revolves around balance in all its forms, which is vital for maintaining the well-being of the planet they inhabit (Wilhelm, Mathison, 2010: 25). Consequently, their social structure entails that the various clans are distributed across different regions of the surface, with each one responsible for a specific area (Wilhelm, Mathison, 2010: 25). The most direct symbol of their connection with nature is their long tail, which has a series of “neural tendrils” (Wilhelm, Mathison, 2010: 28) at the ends that allow them to bond with other creatures that possess similar structures, or with nature itself. Essentially, the tail serves as a bond with *everything*, enabling the Na'vi to connect with creatures vital to their survival or with Pandora itself, accessing its “collective wisdom” (Wilhelm, Mathison, 2010: 29), which again revolves around the spirit of Eywa. In the film, there is a clear example of how this connection happens, such as in the case of the Na'vi bonding with the mountain Banshees (*Ikran* in Na'vi, which translates to “messenger of death”), large and dangerous winged animals (Wilhelm, Mathison, 2010: 29). It is an essential rite of passage for the Na'vi who want to become warriors, however it is very dangerous. To pass the test, the Na'vi must bond with the Banshee through their tails. After this connection, the Na'vi will remain connected for the rest of their lives to the Banshee. This connection enables the Na'vi to effortlessly soar through the skies and master the element of air (Wilhelm, Mathison, 2010: 61).

Hence, the fundamental cultural elements of Na'vi revolve around unity and balance, the paramount importance of nature, and the profound connection to it, all stemming from the central spirit of Eywa.

2.1.3 Influence of the Na'vi culture on the language

Various established conlangers, including Frommer, assert that when creating a language for cinematic purposes, the first and most crucial step is to understand the population for which the language is intended (Academy Originals, 2016). This implies studying its cultural structure. Language and culture are inevitably intertwined, both in the fictional

and the real world. This concept aligns with the previously mentioned Sapir-Whorf hypothesis, which suggests that language influences our thoughts (Fimi, Higgins, 2017: 25). However, the opposite is also true, as language wouldn't exist without the people who speak it, who, in turn, share a specific culture. Frommer himself stated that “every language reflects the environment and culture of its speakers” (Frommer, 2022). In the Na'vi language, various cultural elements are evident within words and phrases. First and foremost, a word that perfectly encapsulates the philosophy of the Na'vi is *meoanuaiaea* (Frommer, 2020), which means “harmony, living at one with nature” (Miller, 2023: 20). This concept revolves around the idea of complete balance that the Na'vi embrace and their connection with nature, which encompasses all living beings (Wilhelm, Mathison, 2010: 25-27) and makes them one with nature and its spirit (*Avatar* in Paliy, 2012: 3). A significant aspect is indeed the centrality of Eywa, which is found in several expressions, for instance, in the name of the planet itself. While humans call it Pandora, the Na'vi refer to it as *Eywa'eveng*, where *'eveng* means "child," signifying "child of Eywa" (Miller, 2023: 59). A similar concept can be found in the expression *Eywa k'sei nivi'bri'sta*, which translates to "Eywa cradles all" (Wilhelm, Mathison, 2010: 38). This phrase refers to their custom of sharing a single large sleep hammock as a family, known as *swaynivi* ("family hammock") or *nivi* in everyday language (Miller, 2023: 37). Eywa is also part of their greetings, such as *Kiyevame ulte Eywa ngahu*, where the “goodbye” is accompanied by a wish meaning "Eywa be with you" (Miller, 2023: 63). Another expression that underlines their spirituality is “*Oel ngati kameie*”, used to greet a family member or an intimately close Na'vi, which literally means "*I See you*” (Miller, 2023: 64). It's a central expression in the movie, repeated several times (*Avatar*, 2009), and it revolves around a different concept of *seeing* compared to the common one: “it's not the physical *see*, but the spiritual *see*” (Frommer, 2018), the "*seeing of essence*" (Paliy, 2012: 1), understanding and perceiving an individual on a deeper level. This phrase serves as more than just a greeting; it symbolizes acceptance and recognizes the existence of an individual and their connection with Pandora (Destruel, 2016: 29). Other interesting aspects of the language connected to the culture are discussed by Frommer in the aforementioned webinar on the creation of the Na'vi language (2020). For instance,

Na'vi have their own proverbial expressions, of which Frommer provided a few examples, with their relative meanings (Frommer, 2020).

Na'vi	English	Explanation
<i>Kxetse sì mikyun kop plltxe.</i>	The tail and ears also speak.	It highlights the expressiveness of the two body parts, the tail and ears, to emphasize that besides listening, observing body language is also crucial (Frommer, 2020).
<i>(Na) loreyu awnampi.</i>	(Like) a touched heliocoradian.	The <i>helicoradian</i> (<i>loreyu</i> in Na'vi) is a sensitive plant, with a unique defense mechanism, which involves retracting into the ground to become no longer visible (Wilhelm, Mathison, 2010: 109). It is a reference to a shy or reserved person (Frommer, 2020).

The language also had to be adapted to the Na'vi from a physical perspective. Despite their "humanoid" appearance, they have another characteristic that sets them apart from humans, in addition to their tails: they only have four fingers on each hand (Wilhelm, Mathison, 2010: 32). This results in an octal numerical system, as opposed to a decimal one. Numbers go from one to eight, where eight is *vol*. All subsequent numbers are expressed as eight (*vol*) plus the corresponding number, which, when added to eight,

results in the specific number one wants to express. For example, nine is *volaw* (eight, *vol* + one, *aw*), and so on (Frommer, 2020).

2.2 The creative process behind the Na'vi language

When contemplating his prospects for the film, James Cameron aimed to provide his alien characters with a comprehensive and coherent language ("Na'vi", 2013: 7). In pursuit of this, he reached out to the linguistic department at the University of Southern California, and ultimately, Paul Frommer, a professor with a PhD in linguistics, was tasked with creating the language ("Na'vi", 2013: 3-7). He immediately began working on it, following James Cameron's guidelines and preferences.

2.2.1 James Cameron's vision

During the webinar on the creation of Na'vi, Frommer emphasized that he didn't have complete creative freedom (2020). Cameron established some essential criteria that the language had to meet. First of all, it had to be an entirely original language, distinct from any existing on Earth. Additionally, though it's a subjective judgment, the language had to have a pleasing sound. Naturally, it needed to be pronounceable by the actors, thus requiring a vocal system akin to the human one, with a similar range of sounds. Not only it had to be pronounceable, but it also had to be learnable by humans, because it was part of the plot. Finally, it had to align with the words already created by Cameron (Frommer, 2020). The director, in fact, had conceived a limited vocabulary in the film's script of approximately 30 words, including names of characters, places or animals (Frommer, 2020), as well as the word *Na'vi* itself (Frommer, 2010a). He drew inspiration from the Maori language to create these words, which indeed carried a Polynesian undertone, as observed by Frommer (2018). Frommer acknowledged that he had to reject some of the words but generally preserved the sound system envisioned by Cameron (Frommer, 2020). Similarly, Frommer had also established parameters for himself to adhere to (Frommer, 2020). As a linguist, he knew that the language had to "stand up to (linguistic) scrutiny" (Frommer, 2020), since he was aware that there might

be critics evaluating his choices for the language. Moreover, he aimed for the language to possess an alien and distinctive quality, while still being learnable by individuals outside the film's cast. He had a strong intuition that people would be interested in learning the language, so he wanted it to be engaging and "ignite people's imagination". This required a delicate balance between complexity and accessibility: the language shouldn't be excessively hard to learn but also not extremely simple, as that could lead to a loss of interest (Frommer, 2020).

2.2.2 Paul Frommer's ideation

Moving on to the practical side, it is a shared idea among various conlangers, including Frommer, that the first aspect to address in creating a language is the phonetic system (Academy Originals, 2016). As mentioned earlier, Frommer already had the sound system envisioned by Cameron as a basis, starting from which, he created a unique sound system for Na'vi. The current updated version of the phonetic system includes sounds related to the Reef Na'vi dialect (Annis, 2010-2023: 9), introduced in the film *Avatar: The Way of Water* (2022). However, they will not be taken into consideration, to prevent any potential confusion. Here is the original version of the phonetic system belonging to the standard Na'vi (Annis, 2010-2023: 9). The language features 20 consonants, 7 vowels, and 2 syllabic consonants, which Frommer called "pseudovowels" (Annis, 2010-2023: 9). Although they appear as consonants, they are vowelized sounds (Pamirik, 2018). Note that the graphic transcription of phonemes, as well as the language in general, is an adaptation of the Na'vi language to the Roman alphabet since the Na'vi do not have a written system (Frommer, 2022).

Table 1. Consonants

	Labial	Alveolar	Palatal	Velar	Glottal
Ejectives	px [pʰ]	tx [tʰ]		kx [kʰ]	
Voiceless stops	p [p]	t [t]		k [k]	ʔ [ʔ]

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 [r], l [l]		
Glides	w [w]			y [y]

Table 2. Vowels

i [i], ɨ [ɨ]				u [u], [ʊ]
	e [ɛ]			o [o]
		ä [æ]	a [a]	

Table 3. Pseudovowels

ll [l:]	rr [r:]
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(Annis, 2010-2023: 9-10).

Furthermore, the language presents three diphthongs: aw, ay, ew and ey (Annis, 2010-2023: 10). While two syllabic consonants exist, vowel length is not present in Na’vi, so identical vowels never occur next to each other (Annis, 2010-2023: 11). The peculiarity of the sound system entails that the language has some additional sounds and some sounds with a different role than those commonly known, at least in the Western hemisphere (Frommer, 2018). Indeed, the most distinctive feature of the Na’vi sound system is the inclusion of the ejectives (*px* [p’], *tx* [t’], *kx* [k’]), which can be described as “popping” sounds (Frommer for Academy Originals, 2016) or click sounds (Akmajian et. al., 2010: 87-88). These sounds are variations of familiar consonants, and they are found in various real human languages, for instance in African languages (Akmajian et. al.,

2010: 87). The presence of these sounds also means that some other common sounds are missing, such as the voiced stops [b], [d], [g] (Frommer, 2018). Further peculiar aspects include the sound *ng* [ŋ], which usually can not be found at the beginning of words in human languages, but can be found as onset consonant in Na'vi (Annis, 2010-2023: 10), or the presence of the so-called pseudovowels (Frommer, 2018).

Subsequently Frommer proceeded with the development of the language's grammatical structure, therefore the morphological and syntactical aspects (Frommer, 2020), which will be largely discussed in the next chapter.

As for the creation of lexicon, Frommer stated that he worked on an "*as needed basis*": he translated the missing words he encountered in the film's script (Frommer, 2010b). For certain vocabulary, for instance the words related to flora and fauna, he relied on visual images and descriptions (Frommer, 2018). During the 2020 webinar, he explained the various methods of word construction he employed further, including borrowing, derivation, and compounding. The most common method was that of derivation, which involves creating words from other existing terms by adding prefixes or suffixes that, in turn, add a new meaning or change the word class (Annis, 2010-2023: 29). Here are some examples presented by Frommer (2020).

Table 4.

Word	Meaning
taron (v.)	(to) hunt
titaron (n.)	hunting [abstract concept]
sätaron (n.)	(a) hunt [specific instance]
taronyu (n.)	hunter

(Frommer, 2020).

The method of compounding, on the other hand, involves combining multiple words or elements to create new words or expressions. One intriguing example provided by Frommer (2020) is the expression *Eltur tixen si*, which means "be interesting". It derives

from *eltu(-r)*, which means “brain” (Miller, 2023: 7), and *tìtxen si*, which means “to waken” (Miller, 2023: 43). *Si* is a compounding construction used to transform a noun or adjective into a verb (Annis, 2010-2023: 32), in this case *tìtxen* indicates “the state of waking”, and by adding *si* it becomes “to waken” (Miller, 2023: 43). Borrowing was a less common method, primarily used for words with a “foreign” (human) origin, which were then filtered through Na'vi phonetics. Some instances are the word *'Rrta* (Earth) and the word *puk* (book), concept that didn't exist in Na'vi culture since they lack a written system (Frommer, 2020).

Lastly, Frommer mentioned that he often relied on experimentation to create new words and roots, based on “*what sounded best*” (Frommer, 2020). He described this aspect as the “more artistic side” of language creation (Frommer, 2018). Based on the sound of words, for example, Frommer came up with some interesting antonyms (2020).

Table 5.

Na'vi	English	Na'vi	English
<i>ftue</i>	easy	<i>faoi</i>	smooth
<i>ngäzìk</i>	difficult	<i>ekxtxu</i>	rough

(Frommer, 2020).

Upon the film's release, the language had a rather limited vocabulary, including perhaps 500 words (Frommer, 2018). As previously stated, Frommer's primary objective at the time was to create a language that could fulfil the script requirements, so it did not expand much beyond that (Frommer, 2018). It was only after the film achieved success that the language's vocabulary started to grow.

2.3 The success and the expansion of the language

As it was emphasized at the end of the previous chapter, in today's world, the internet plays a central role in supporting the realm of constructed languages, particularly

fictional languages. Much like the case of other languages created for cinema, the Na'vi language has garnered significant popularity among enthusiasts. The primary reason for this can undoubtedly be attributed to the success of the film and the emotions it has generated in its viewers, encompassing both positive and negative sentiments. In fact, since the movie's release, a shared sense of nostalgia for a world impossible to be a part of has spread among many individuals, sometimes even leading to states of depression (Sodahead, 2010; Piazza, 2010, cited in Falquina, 2014). This phenomenon is known as "The Pandora effect" or "Post-Avatar Depression" (Mulrooney, 2011: 201, cited in Falquina, 2014). Regarding the language, Frommer mentioned that when he was creating it, he already foresaw that people would show interest for it (2020). For this reason, he aimed to strike a balance between "complexity and accessibility", making sure that the language wouldn't be excessively difficult to learn while maintaining it interesting enough to make people want to learn it (Frommer, 2020). However, he did not expect that much of a success (Frommer, 2010a). As Frommer stated in an interview, shortly after the film's release, he began receiving emails from fans written in Na'vi (Frommer, 2010a). In a short period, a large online community formed around the language, actively and directly contributing over the years to the expansion of the language's vocabulary (Frommer, 2014). People continue to request new vocabulary or even suggest new terms themselves (Frommer, 2018). However, Frommer highlighted that he is the "sole gatekeeper" of the language, the one who approves and has the final say on introducing new elements to the language (Frommer, 2022). While he hasn't personally authored a publication explaining the language creation process, there are documents approved by him that can be roughly considered "official". These documents can be found on the main forum site for Avatar and Na'vi language enthusiasts: Learnnavi.org. Linguistic information presented in this chapter, and which will be central in the following chapter, is drawn from these documents. Furthermore, there is an additional website created by Paul Frommer himself, Naviteri.org, which serves as his blog where he posts updates about the language (Frommer, 2018).

By taking this into consideration, it is important to note that the information regarding the linguistic aspects of the language, discussed in this study work, should be understood within the context of the version and date of those works presented in the bibliography.

CHAPTER 3: UNVEILING THE NA'VI LANGUAGE

3.1 Balancing realism and artistic purpose: designing a language for cinema

Given the information gathered so far, it is possible to provide an overview of the essential characteristics of artistic languages, more specifically languages constructed for fictional cinematic products. To begin with, as stated by several conlangers in an interview with Academy Originals (2016), including Frommer, the initial aspect taken into consideration is the population for whom the language is crafted. The language must be "appropriate for the people [...]" (Frommer for Academy Originals, 2016). In the specific case of languages created for science-fiction settings, a central element is the uniqueness of the language. Since the characters are usually extra-terrestrials, the language should sound and feel *alien*. This is true for languages like Klingon, as expressed by Marc Okrand himself (Academy Originals, 2016), and for Na'vi, where James Cameron explicitly requested that the language had to sound different from any existing on Earth (Frommer, 2020). However, the alien quality of the language poses a challenge to another aspect of fictional languages mentioned earlier: authenticity (Peterson, 2015: 24). While the language should be unfamiliar to humans, it must also maintain a degree of realism for practical reasons. For instance, it should be easy for actors to pronounce. In the case of the Na'vi language, James Cameron refused to rely on electronic voice manipulation, ensuring that "the vocal mechanism of the Na'vis had to be similar to ours, since the voices are similar, as well as the range of sounds they could produce" (Frommer, 2020). Additionally, within the fictional context, the Na'vi language needed to be easily learnable by humans as part of the plot (Frommer, 2020). Simultaneously, Frommer envisioned its learnability in the real world, anticipating the potential passion people might develop for the language, as observed with other renowned fictional languages (Frommer, 2020). This relates to the concept of the language being "real" for its fictional speakers (Peterson, 2015), contemplating its origin and evolution over time, much like a natural language (Frommer, 2018).

The contrast between these elements brings out the necessity of finding a balance between the alien and realistic aspects of constructed languages. The aim of this study is to unravel the Na’vi language according to these aspects.

3.2 Realism in the cultural aspects of the language

Before delving into the linguistic elements, it's intriguing to observe realism in the actual language features. The very influence of culture on language, as analyzed in the second chapter, is an example of realism. Several specific cultural aspects may more concretely clarify this concept. The proverbial aspects of the language represent an instance. Some proverbs have already been touched upon in the preceding chapter. As Frommer pointed out in the 2020 webinar, "in English and other languages, proverbs usually follow wordplay [...], the same applies to Na’vi". Essentially, this practice involves combining words with similar or pleasing sounds to create idioms. Here are some examples provided by Frommer:

Table 6.

Proverb	Meaning	Explanation
<i>Kem aumiä, kum afe.</i>	Good action, bad result.	<i>Kem</i> means “action”, <i>kum</i> means “result”.
<i>Fwäki ke fwefwi.</i>	A mantis doesn’t whistle.	Do not expect someone to do something not in their nature.

(Frommer, 2020).

Another facet of realism can be traced in the presence of dialects in the language. As Frommer himself mentioned, "it would be unusual if there were no dialects" in the language (2018). This aspect is tied to the fact that, as discussed in the previous chapter, there are different clans of Na’vi scattered throughout various regions of Pandora

(Wilhelm, Mathison, 2010: 26). Although none of the other clans appeared in the first Avatar film (2009), a Reef dialect surfaces in the second film, *Avatar: The Way of Water* (2022), where the Reef Na'vi are introduced, a clan that inhabits the coasts of Pandora and uses the element of water for sustenance and as a form of connection with nature. As mentioned in the preceding chapter, any details regarding this dialect will be omitted in this work to avoid confusion. Along with dialects, Na'vi has also different registers. The most prominent one is the ceremonial register, which is marked with different specific pronouns and “with the verb affect infix -uy-“ (Annis, 2010-2023: 67).

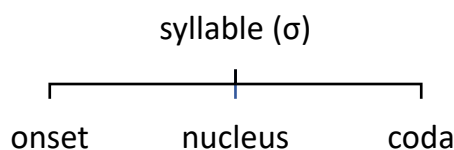
3.3 Realism in the linguistic aspects of the language

As stated by Frommer, the Na'vi language primarily has a Polynesian flavor in its sounds, but otherwise, it is not based on any human language (Frommer, 2009). For this reason, it can be categorized as an *a priori* language. However, simultaneously, its creator asserted that “there’s nothing in Na'vi that couldn’t be found in some human language [...], (it’s rather) the combination of elements that is unique” (Frommer, 2009). In the following study, the phonological, morphological, and syntactic aspects of the language will be analyzed to explore those elements of Na'vi that are familiar to natural languages.

3.3.1 Phonology

The phonological analysis will begin with an examination of the syllabic structure in Na'vi. In linguistics, the structure of a syllable is indicated by the following pattern:

Graphic (a).



(Akmajian et. al., 2010: 127).

The most common syllable structure among natural languages is the CV(C) structure, therefore a consonant followed by a vowel which, optionally, can be followed by another consonant (Akmajian et. al., 2010: 127). Vowels usually form the *nucleus* of the syllable, while consonants are located at the beginning (*onset*) or ending (*coda*) of the syllable (Akmajian et. al., 2010: 127). While the other two elements are not essential, the nucleus is crucial and must always be present for a set of sounds to be considered a syllable (Graffi, Scalise, 2013: 103). In the case of the Na'vi language, it has a “strict but straightforward syllable structure” (Annis, 2010-2023: 10). The rules for syllable construction can be condensed as follows:

a syllable may start or end with a vowel, without necessarily having a consonant as onset or coda;

any consonant may start a syllable (including the glottal stop);

a consonant cluster of **f, s, ts + p, t, k, px, tx, kx, m, n, ng, r, l, w, y** may start a syllable;

only the consonants **p, t, k, px, tx, kx, ', m, n, l, r, ng** may occur in the syllable final position;

consonants clusters can not occur in syllable final position;

the nucleus of a syllable can be formed by a vowel, diphthong or pseudovowel;

a syllable including a pseudovowel as the nucleus must start with a consonant or consonant cluster and must not have a final consonant as coda.

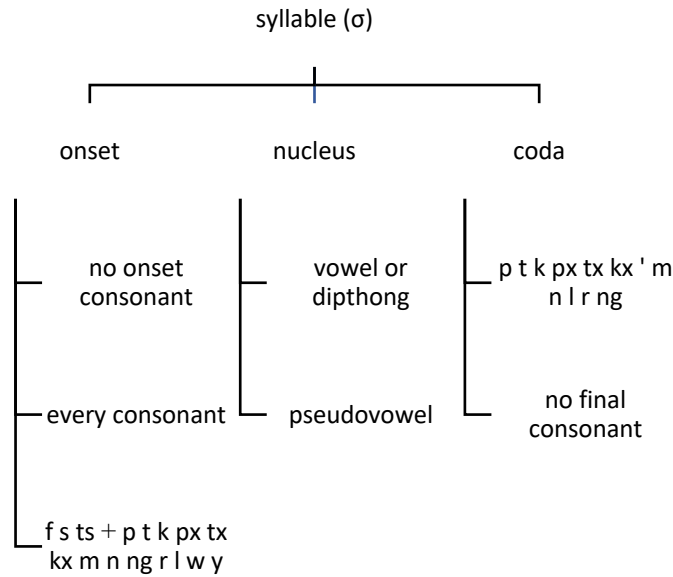
(Annis, 2010-2023: 10).

Due to the first rule, it is possible for multiple vowels to appear consecutively within a word. In such cases, each vowel corresponds to a syllable (Annis, 2010-2023: 10). In this sense, the Na'vi language is akin to the Italian, where the nucleus is always formed by a vowel (Graffi, Scalise, 2013: 103); whereas in English syllables can be formed also by consonants, as in the word *button* [bʌʔn], in which the /n/ is a single syllable (Akmajian et. al, 2010: 127). Taking the Na'vi word *ioang* ‘animal’ (Miller, 2023: 12) as an example, the syllabic structure is [i.o.aŋ] (Annis, 2010-2023: 10). However, diphthongs do not

adhere to this rule, as they are pronounced as a single vowel sound (Pamirík, 2018). Furthermore, since in Na'vi long vowels do not exist, identical vowels can not occur next to each other (Annis, 2010-2023: 10-11). Another aspect that is interesting to highlight is that consonant clusters adhere to a sonority scale, a rule commonly followed in human languages (De Dominicis, Treccani, 2010). The sonority scale indicates that, in the case of consonant clusters, they follow a specific order based on a hierarchical scale of sounds, where the harshest sounds are further from the nucleus and the most mellow sounds are nearer to it (De Dominicis, Treccani, 2010). Every language has its own sonority scale; however, the universal hierarchy places the sonorants right near the nucleus, followed by fricatives and stops, with the voiced sounds preceding the voiceless ones (De Dominicis, Treccani, 2010). According to this order, it can be asserted that, in onset consonant clusters, the sonority hierarchy is respected in Na'vi for clusters beginning with the affricate /ts/ when followed by all the other possible elements, except the ejective sounds /px, tx, kx/; and for clusters beginning with the voiceless fricatives /f/ and /s/ when followed by all the other elements except the voiceless stops /p, t, k/ and the ejectives /px, tx, kx/. Therefore, it can be stated that the sonority scale of Na'vi places fricative sounds and the affricate sound above stops and ejectives in hierarchical order, followed by nasal, liquids and glides.

Here is a visual representation of all the rules:

Graphic (b).



(Annis, 2010-2023: 10).

In terms of word-internal syllable division, the online Na’vi grammar indicates that, given a sequence like VCV, where V is any vowel and C is any consonant (Akmajian et. al., 2010: 127), Na’vi usually follows the V.CV syllabification (Annis, 2010-2023: 11), where the medial C is the onset of the second syllable; exactly like in English (Akmajian et. al., 2010: 127). Indeed, according to the authors of *Linguistics. An introduction to Language and Communication* (2010), this is the correct formula for English, and it is “a consequence of general property of English syllabification” (Akmajian et. al., 2010: 127). The example given in the Na’vi grammar is the following: *tsenge* ‘place’ (Miller, 2023: 46), with [tɬɛ.ŋɛ] as syllabic structure (Annis, 2010-2023: 11). From this perspective, Na’vi conforms to two principles commonly observed in human languages. Firstly, it aligns with the Maximal Onset Principle, a feature it shares with English, where the maximum number of consonants is arranged as a syllable onset, adhering to the sonority scale (Akmajian et al., 2010: 128-129). Secondly, as a consequence, Na’vi tends to favor syllables without codas, also known as open syllables (Bertinetto, Treccani, 2011). Indeed, Na’vi has a limited number of possible consonants for codas and generally prefers the syllable to conclude with a vocalic nucleus, as can be observed in the example above. This

consideration sets Na'vi apart from languages like Italian and English, despite being found in various other languages globally. Nevertheless, as stated by the author of the Na'vi grammar, as it is common in most human languages, there are some interjections in Na'vi that can "break the rules", such as onomatopoeia sounds *o`sss* (a sound for anger) and *saa* (a threat cry) (Annis, 2010-2023: 11). Although, in a phrasal context, the final part of the syllable would likely be syllabified as the onset of the following syllable. Remaining on the topic of syllabification, it is also compelling to look at how stress is handled in Na'vi. Generally, "every Na'vi word has at least one stress accent", although it does not follow specific rules and is therefore unpredictable (Annis, 2010-2023: 11), as personally stated by Frommer (2018). In linguistics, unpredictable stress is referred to as "free accentuation" (Graffi, Scalise, 2013: 106). This type of stress is common to several human languages, including Italian and English, as opposed to languages with fixed stress, like Hungarian or French, where the accent consistently falls on specific syllables (Graffi, Scalise, 2013: 106). Going back to Na'vi, in rare instances identical words may differ only by accent, such in the case of *tute*, which means both 'person' and 'woman'. This is the only situation where stress can be marked to clarify the meaning of the word (*tuté* = woman), while for the most part, stress is not indicated graphically (Annis, 2010-2023: 11), like in English, except for the *ì* sound. An intriguing aspect is that some compound nouns may maintain both original accents of the words they derive from, as in the case of *tireafya'o* 'spirit path' (Annis, 2010-2023: 11). This happens also in Italian with compound words, such in the case of the word *capostazione* 'station manager', where two accents can be recognized, a primary one on the 'o' in "stazione" and a secondary one on the 'a' in "capo" (Graffi, Scalise, 2013: 106).

Lastly, the phonological transformations of Na'vi will be explored. First and foremost, the Na'vi language is subject to a process known as "lenition", where the initial consonant of a word undergoes a transformation in terms of manner of articulation when preceded by certain elements (Annis, 2010-2023: 13). The consonants which undergo lenition are 8, and they behave according to the following pattern:

Table 7.

Consonant	Lenition	Example	Explanation
px, tx, kx	> p, t, k	<i>txep</i> (fire) -> <i>mì tep</i> (Miller, 49)	<i>mì+</i> is an adposition meaning “in, on” (Miller, 21)
p, t, k	> f, s, h	<i>kelku</i> (home, house) -> <i>ro helku</i> (Miller, 13)	<i>ro+</i> is an adposition meaning “at” (Miller, 31)
ts	> s	<i>tsmukan</i> (brother) - > <i>aysmukan</i> (Miller, 46)	<i>ay+</i> is the number prefix for plurality (Annis, ?)
‘	> disappears	<i>‘eylan</i> (friend) -> <i>fpi eylan</i> (Miller, 5)	<i>fpi+</i> is an adposition meaning “for the sake/benefit of” (Miller, 9).

(Annis, 2010-2023: 13).

The author of the Na’vi grammar specifies that the prefixes which cause lenition are followed by the plus sign rather than the dash (Annis, 2010-2023: 13), and they are presented in this way in the Miller dictionary as well, so the same format is maintained in this paper. Lenition is caused by the following grammatical elements: the adpositions

fpi, ilä, mì, nuä, ro, sko, sre, wä; number prefixes *me+*, *pxe+*, *ay+*; question prenuon *pe+* (Annis, 2010-2023: 13). Also suffixed and dependent forms of numbers undergo lenition, as well as proper nouns. For example, *pxey* ‘three’ becomes *pey* when added as a suffix to *vol* ‘eight’, to make *vopey* ‘eleven’. Instead, an example with a proper noun is the following, which also allows to see how sentence formation works in Na’vi: *Oe kelku si mì Helutral* (Annis, 2010-2023: 13).

Table 8.

Oe = I, me (first person singular) (Miller, 27).	kelku = home, house (Miller, 13).	si = post-positional verb deriving affix (Miller, 70).	mì = <i>mì+</i> is an adposition meaning “in, on” (Miller, 21).	Kelutral = Hometree (Miller, 59).
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In this case, the construction "si" (already seen in an example in chapter 2) transforms *kelku* from a noun to a verb (*to live*), therefore, the meaning is "I live in Hometree". However, since, as will be clarified in the following paragraphs, Na’vi has free constituent order (Annis, 2010-2023: 64), this expression can also be formed like this: *Oe kelku si Kelutralmì* (Miller, 2023: 70), where lenition does not occur because *mì* is placed as a suffix of the proper noun; but the meaning remains unchanged.

Further instances of phonological transformations are vowel contraction, pseudovowel contraction and elision (Annis, 2010-2023: 14-15). Vowel contraction is related to the fact that there is no vocalic length in Na’vi, and identical vowels may not occur next to each other. Therefore, in some cases, two vowels contract into one (Annis, 2010-2023: 14). There are three morphological processes through which this change occurs. The first involves the -a- affix of attributive adjectives, which connects adjectives to the nouns they refer to (Annis, 2010-2023: 23). When the adjective begins or ends with the vowel *a*, the -a- affix is dropped, e.g. *apxa tskxe* ‘large stone’ (Miller, 2023: 46) and not **apxaa tskxe* (Annis, 2010-2023: 14). Another case concerns the dual and trial prefixes *me+* and *pe+*, when attached to a noun starting with an *e*. For instance, *me + ‘eveng* ‘child’ (Miller, 2023: 5) becomes *meveng* and not **meeveng* (Annis, 2010-2023: 14). Lastly, if a prenoun

prefix ends with the same vowel of the following word, they contract to one, e.g. *tʂa* ‘that’ + *atan* ‘light’ (Miller, 2023: 45; 6) becomes *tʂatan* and not **tʂaatan* (Annis, 2010-2023: 14). However, vowel contraction is not applied for “indefinite -o- or enclitic adpositions” (Annis, 2010-2023: 14). In such cases, the two vowels are separated by a hyphen, e.g. *fya’o-o* ‘some way’ (Annis, 2010-2023: 14). Pseudovowel contraction concerns the verbal infixes *-er-* and *-ol-*, which indicate aspect, specifically imperfective and perfective, respectively (Annis, 2010-2023: 24). When these infixes occur next to a pseudovowel, there are two possible solutions according to the stress position. If the syllable is unstressed, the pseudovowel disappears, e.g. *poltxe* from *plltxe* ‘to speak’ (Miller, 2023: 29) and not **p-ol-lltxe* (Annis, 2010-2023: 14). The same rule is applied to pseudovowels in monosyllables, e.g. *vol* from *vll* ‘to indicate, to point at’ (Miller, 51) and not **v-ol-ll*. On the contrary, if the syllable is stressed, the pseudovowel is retained, but the infix disappears, e.g. *frrfen* ‘visit’ (Miller, 2023: 9) and not **f-er-rrfen* (Annis, 2010-2023: 14). The last phonological transformation that will be analyzed, although some others may occur in the language, is elision, which applies only to speech and is not indicated in written language. More specifically, it applies to rapid speech, where the final *-e* is elided if the following word starts with a vowel (Annis, 2010-2023: 15). Taking the following sentence as an example: *Kiyevame ulte Eywa ngahu* ‘Goodbye and Eywa be with you’, in speech it appears as such: *Kiyevawe ulte Eywa ngahu*, where the two underlined ‘e’s are not pronounced. This does not apply if the *-e* is in a monosyllable, e.g. *ke*, *sre*, or if it stressed, as in *tuté* (Annis, 2010-2023: 15). The vowel *ì* in the affixes *-mì-*, *-sì-* and *-nì-* (adverbial prefix) is elided when followed by the plural prefix *ay+* (Annis, 2010-2023: 15). In writing the form is maintained, therefore the written form *nìayfo* ‘like them’ is pronounced *nayfo*. In the specific case of the prefix *nì-*, the vowel is usually elided before a stressed ‘e’, e.g., *nì-* + *etrìp* becomes *netrip* ‘favorably, auspiciously’ (Miller, 2023: 7). On the contrary, when the ‘e’ is unstressed, it will be the one to elide, e.g., *nì-* + *eyawr* becomes *nìyawr* ‘correctly’ (Miller, 2023: 7). However, there are exceptions to this last rule, an example is *nì-* + *ean* which becomes *nìean* and not **nìan* (Annis, 2010-2023: 15), which is an interesting form since *ean* means ‘blue, green’ (Miller, 2023: 7) and colors usually do not have adverbial form in human languages.

3.3.2 Morphology

Natural languages are classified genealogically and typologically (Graffi, Scalise, 2013: 59-65). While the first classification is not applicable to a constructed language, it is possible to classify the Na’vi language based on typology. In attempting to classify it based on morphological typology, the result would be that the Na’vi language belongs to the *agglutinative* category, similarly to Turkish. This means that the grammatical categories are indicated by affixes, each one of which indicates a specific category (Graffi, Scalise, 2013: 66). The following representation is based on the table on page 66 of *Le lingue e il linguaggio. Introduzione alla linguistica* (2013), but with Na’vi cases. The noun taken as an example is *pa’li* ‘direhorse’ (Miller, 2023: 62).

Table 9.

	Singular	Plural
Subjective	pa’li	(ay+)fa’li
Agentive	pa’li-l	(ay+)fa’li-l
Patientive	pa’li-t	(ay+)fa’li-t
Dative	pa’li-r	(ay+)fa’li-r
Genitive	pa’li-yä	(ay+)fa’li’-yä
Topical	pa’li-ri	(ay+)fa’li-ri

Let's analyze these morphological features in detail. Firstly, it is possible to observe the previously mentioned leniting process that changed /p/ to /f/. In this case, the plural prefix is in parentheses because it can be omitted if it causes lenition (Annis, 2010-2023: 18). Therefore, both forms are correct. Taking this aspect into consideration, it can be asserted that this process generates a form of suppletion, as the /f/ replaces the role of the plural prefix, becoming itself an indicator of plurality. However, as emerged in the phonology section, Na’vi presents not only the plural but also the dual and the trial forms, indicated respectively by the prefixes *me+* and *pxe+* (Annis, 2010-2023: 18). Here

are all numeral forms of the word *hafyon* ‘wisdom’ (Miller, 2023: 11). The table form for this example is taken from page 75 of Destruel’s study, but with a different noun.

Table 10.

Singular	<i>hafyon</i>
Dual	<i>mehafyon</i>
Trial	<i>pxehafyon</i>
Plural	<i>ayhafyon</i>

From the example in table 9, moreover, it can be noted that the Na'vi language has both prefixes and suffixes, but it will be clear further that it presents also infixes. Therefore, it has all three categories of inflectional and derivational morphology. The use of one of the three categories of affixes depends on various factors. On one hand, it depends on the position in which they are inserted, given that, once again, Na'vi has a free constituent order (Annis, 2010-2023: 64). On the other hand, it depends on the part of speech to which it refers. As stated by Frommer, "Na'vi parts of speech are the same as many familiar languages," including English: it has nouns, verbs, adjectives, and adverbs (Academy Originals, 2016). These are known as content words or open-class words (Akmajian et. al., 2010: 24). Whereas function words, i.e. specific grammatical elements such as prepositions, demonstratives etc. (Akmajian et. al., 2010: 24), are expressed in Na'vi by affixes (Annis, 2010-2023: 20-22), which are usually considered as part of the closed-classes words (Akmajian et. al., 2010: 25). They mostly appear as prenouns, which are "adjective-like noun prefixes" (Annis, 2010-2023: 20), and form fixed demonstrative pronouns, as well as adverbs of time, manner, place and so on, referred to as *correlatives*. The online Na'vi grammar, however, specifies that it is not always a regular system (Annis, 2010-2023: 21). Here is a table containing the most common forms of demonstratives and adverbs:

Table 11.

	Person	Thing	Action	Time	Place	Manner
<i>this</i>	<i>fipo</i> 'this one'	<i>fi'u</i> 'this (thing)'	<i>fikem</i> 'this (action)'	<i>set</i> 'now'	<i>fitseng(e)</i> 'here'	<i>fifya</i> 'thus'
<i>that</i>	<i>tsatu</i> 'that one'	<i>tsa'u</i> 'that (thing)'	<i>tsakem</i> 'that (action)'	<i>tsakrr</i> 'then'	<i>tsatseng</i> 'there'	<i>tsafya</i> 'in that way'
<i>all</i>	<i>frapo</i> 'everyone'	<i>fra'u</i> 'everything'	-	<i>frakrr</i> 'always'	<i>fratseng</i> 'everywhere'	<i>fracya</i> 'in every way'
<i>no</i>	<i>kawtu</i> 'no one'	<i>ke'u</i> 'nothing'	<i>kekem</i> 'no action'	<i>kawkrr</i> 'never'	<i>kawtseng</i> 'nowhere'	-

(Annis, 2010-2023: 21).

Returning to content words, nouns take different suffixes depending on the cases and the sounds with which they end: consonants, vowels, or diphthongs. As seen in Table 9, the Na'vi language has 6 cases. Note that the names of the cases were chosen by Frommer based on the "terminology used by Bernard Comrie in his writings on ergative languages" (Annis, 2010-2023: 17). Usually, the subjective case is referred to as the intransitive case, the agentive case is the ergative, and the patientive is the accusative (Annis, 2010-2023: 17). To better understand the cases, it is necessary to make a preliminary note: Na'vi is a tripartite language (Destruel, 2016: 30), in which transitivity plays a central role. The subject is marked differently according to the transitive or intransitive nature of verbs (Annis, 2010-2023: 35). Indeed "the subjective case is used as the subject of intransitive verbs [...]" (Annis, 2010-2023: 41), while "the agentive case is used for the subject of transitive verbs" (Annis, 2010-2023: 42).

Table 12.

	Vowel	Consonant & pseudovowel	Diphthong
Subjective	-	-	-
Agentive	-l	-il	-il
Patientive	-t, -ti	-it, -ti	-ti, -it, -ay-t, -ey-t
Dative	-r, -ru	-ur, -'ru	-ru, -ur, -aw-r, -ew-r
Genitive	-yä, -o-ä, -u-ä	-ä	-ä
Topical	-ri	-iri	-ri

(Annis, 2010-2023: 17).

Some suffixes follow specific rules; for the rest, it depends on emphasis and style (Annis, 2010-2023: 18). For instance, words ending in pseudovowels take the endings -ä and -it in the patientive and genitive cases (*trr-ä*; *'ewll-it*); the genitive is -yä for all the vowels except *o* and *u*, which take the -ä suffix (*Na'vi* > *Na'viyä*; *tsulfätu* > *tsulfätuä*); the same applies to words ending in -ia, which take -iä as genitive (*soaia* > *soaiä*). Furthermore, when a word ends in a diphthong with *y*, the patientive -it is simplified to -t because of the similarity of sound between *y* and *i*, therefore *keyey* becomes *keyeyt* and not **keyeyit*. The same can happen with the dative -ur because of the similarity of sound between *w* and *u*, but, in this case, it is not mandatory, therefore both *'etnawur* and *'etnawr* forms are correct (Annis, 2010-2023: 17). The dative -ur is applied to all nouns ending in consonants; however, one ending in glottal stop can take the dative in -ru, e.g., *lifyaolo'ru* (Annis, 2010-2023: 17).

The presence of a case system with specific endings is not a feature of all languages, even though the elements the cases describe are, instead, present in every language. Some examples of languages where the case system is central include, for instance, Russian (Cevese et. al., 2018: 34), German, or Latin among the ancient languages.

As mentioned in the phonology section, attributive adjectives are linked to the noun through the affix -a-, which is attached to the adjective as a prefix or suffix, depending on where the noun is in the sentence. The placement follows the concept of the noun

and adjective being close to one another. The phrase ‘a fast person’ can indeed be expressed as both *tute awin* or *wina tute* (Annis, 2010-2023: 23). Adjectives do not present any distinctive feature, therefore outside the sentence they can be distinguished only through the dictionary. However, a specific category of adjectives can be recognized by the derivational prefix *le-*, which is attached to nouns when creating new adjectives in Na’vi, e.g. *lehrrap* ‘dangerous’ from *hrrap* ‘danger’ (Annis, 2010-2023: 29). When in a sentence, *le-* derived adjectives cause the *-a-* affix, which connects them to the noun, to be dropped when prefixed, but maintained when suffixed. For instance, the phrase *ayftxozä lefpom* ‘happy celebrations’ (Miller, 2023: 10; 17) is the most common in this form, however *lefpoma ayftxozä* is also correct and *ayftxozä alefpom* is not necessarily an error, while **lefpom ayftxozä* is uncorrect (Annis, 2010-2023: 23).

As for verbs, they express grammatical relationships through infixes, which was emphasized also by Frommer (2020). “All infixes occur in the last and next-to-last syllables of the verb stem, and are inserted before the vowel, diphthong or pseudovowel of that syllable” (Annis, 2010-2023: 23). In case there is no onset consonant, the infix precedes the vowel, e.g., *omum* > *-iv-omum* (Annis, 2010-2023: 23). The stress remains on the original vowel of the verb, except in the verb *omum* ‘to know’ (Miller, 2023: 27), where the original accent is on the *u* but shifts to the *o* in inflected and derived forms, and in the verb *inan* ‘to read (e.g. the forest)’ (Miller, 2023: 12), where the accent from the *a* is shifted to the *i* (Annis, 2010-2023: 23). In the case of compound verbs, infixes are typically inserted into only one of the elements of the compound, e.g. the compound verb *yomtìng* ‘feed’, from *yom* ‘eat’ and *tìng* ‘give’, forms the perfective as *yomt-ol-ìng* and not **y-ol-omtìng*. However, there are some exceptions, such in the case of *kan’ìn* ‘specialize in’, where the infixes go in both the compound elements *kan* ‘aim, intend’ and *’ìn* ‘be busy’ (Annis, 2010-2023: 24). Three types of infixes can be distinguished according to three different positions, which Frommer described as pre-first position, first position and second position (Annis, 2010-2023: 23). The pre-first position has two infixes, the causative *eyk* and the reflexive *äp*, which both change the transitivity of the verb (Annis, 2010-2023: 24). First position infixes “mark tense, aspect and mood” (Annis, 2010-2023:

24). In case a verb form presents a pre-first position prefix, the first position one follows (Annis, 2010-2023: 24).

Table 13.

	Tense	Perfective	Imperfective
Future	-ay-, -asy-	-aly-	-ary-
Near future	-iy-, -isy-	-ily-	-iry-
General	-	-ol-	-er-
Near past	-im-	-ilm-	-irm-
Past	-am-	-alm-	-arm-

(Annis, 2010-2023: 24).

First position infixes can also create participles, and “they do not combine with tense, aspect and mood infixes”: *-us-* for **active** and *-awn-* for **passive**. Participles function as adjectives, so they always come with the adjectival affix *-a-* (Annis, 2010-2023: 25). Lastly, second position infixes indicate speaker’s attitude and judgement.

Table 14.

Positive attitude	-ei-, -eiy-
Negative attitude	-äng-, -eng-
Formal, ceremonial	-uy-
Inferential, suppositional	-ats-

(Annis, 2010-2023: 25).

As a concrete example, here are some possible inflected versions of the usual verb Frommer uses in examples: *taron* ‘hunt’ (Annis, 2010-2023: 25).

Table 15.

	<i>taron</i>
Near past	tìmaron
Reflexive	täparon
Refl., near past	täpìmaron
Ceremonial	taruyon
Perf., cerem.	tolaruyon
Refl., perf., cerem.	täpolaruyon

(Annis, 2010-2013: 25).

In verb formation, the agglutinative system of the language persists, as various infixes coexist and indicate different meanings. It is interesting to note the presence of verbal aspect, a feature also found in natural languages, which usually adds time meanings to the verbs (Biber et al., 2002: 156). In English the aspect is indicated by the perfect and the progressive or continuous forms, and they indicate whether an action (or state) is completed or still in progress (Biber et al., 2002: 156). A concrete similarity to Na'vi can be found in Russian, where the verbal aspects take the same names as in Na'vi: perfective and imperfective. They represent specific situations or actions and the points of view in which they take place (Cevese et al., 2018: 303). In the Na'vi grammar, their specific meanings and purposes are not specified and can only be deduced. A final aspect which is interesting to explore is the formation of pronouns. These are the basic pronouns in Na'vi:

Table 16.

Person	Singular	Dual	Trial	Plural
1st exclusive	oe	moe	pxoe	ayoe
1st inclusive	-	oeng	pxoeng	ayoeng, awnga
2nd	nga	menga	pxenga	aynga
3rd animate	po	mefo	pxefo	ayfo, fo

3rd inanimate	tsa'u, tsaw	mesa'u	pxesa'u	aysa'u, sa'u
reflexive	sno	-	-	-
indeterminate	fko	-	-	-

(Annis, 2010-2023: 19).

While languages like English or Italian typically have fixed forms for both singular and plural pronouns, in Na'vi, only the singular pronouns exist as a basis, and the plurals are formed from numeral prefixes. Additionally, Na'vi pronouns follow the same case endings as nouns (Annis, 2010-2023: 18). An interesting feature is the presence of "exclusive" and "inclusive" first-person pronouns, where the inclusive form does not have a singular counterpart. The inclusive form indicates that the person addressed is included in the action or state expressed, making it only applicable in the plural context, unlike the exclusive form, where the addressed person is excluded (Annis, 2010-2023: 19). Furthermore, a grammatical distinction of gender does not appear (Destruel, 2016: 30). Gender can be indeed expressed thorough suffixes in Na'vi, which occur with both nouns and third person pronouns (Annis, 2010-2023: 31), but they are not mandatory (Destruel, 2016: 30).

Table 17.

male	-an	<i>'itan</i> 'son'; <i>poan</i> 'he'
female	-e	<i>'ite</i> 'daughter'; <i>poe</i> 'she'

(Annis, 2010-2023: 31).

However, the presence of an inanimate third person is specified. The existence in Na'vi of an inanimate person is intriguing since it is common in different human languages, including English (Akmajian et. al., 2010: 169) and, again, Russian (Cevese et. al., 2018: 208). A curious aspect is that for animals in Na'vi the animate pronoun is preferred

(Annis, 2010-2023: 19), which reflects their cultural habits and connection to nature, encompassing all living beings.

The largest part of morphological rules presented so far were examples of inflectional morphology, as they do not change the class of words (Akmajian et. al., 2010: 46). However, it was established in the second chapter that the Na'vi language also employs derivational morphology and compounding for word building, which is ensured by the Na'vi grammar as well (Annis, 2010-2023: 29). Both are the most common morphological processes used for word building in natural languages (Graffi, Scalise, 2013: 125). Usually, in Na'vi, the derivational process changes the word class and happens according to specific affixes, but the resulting meanings are not always predictable (Annis, 2010-2023: 29). An example is the previously mentioned transformation of nouns into adjectives with the prefix *le-* (Annis, 2010-2023: 29), or the examples provided in the second chapter.

To sum up, it is possible to assert, based on the information gathered above, that infixes are employed for verb inflection, suffixes are primarily utilized as case endings, in specific cases of noun inflection (e.g., gender), or in specific instances of derivation in word building, while prefixes serve as numeral forms, adpositions, prepositions, and other specific cases of word building derivation processes. In general, all affixes have a specific role and position based on their function. Although there are exceptions, as in the previously mentioned example of the adposition *mì+* 'in, on' (Miller, 2023: 21), which can be inserted both before the noun it refers to, causing lenition, and after as a suffix. This is, however, connected to a syntactical choice, which will be discussed in the next section. A summary of both inflectional and derivational affixes can be found not only in the Na'vi Grammar (Annis, 2010-2023), but also in the Na'vi dictionary on pages 67-70 (Miller, 2023).

3.3.3 Syntax

As with morphological typology, a classification based on syntactic typology is also possible, thanks to the theories of Greenberg (Graffi, Scalise, 2013: 68). In particular, the "position of the verb (V) with respect to the subject (S) and the object (O) in the

declarative sentence" is an aspect commonly analyzed in syntactic studies (Graffi, Scalise, 2013: 68). Based on this, six possible syntactic sentence orders have been identified: SVO, SOV, VSO, VOS, OSV, OVS, of which only three are the most common in human languages, the last one does not exist, and the other two are rare (Graffi, Scalise, 2013: 69). English, for instance, mostly follows the SVO order (Annis, 2010-2023: 64). According to this classification, the Na'vi language takes a peculiar position, being a declared *free word order* language. This terminology is not exactly accurate, in fact the Na'vi Grammar refers to it as *free constituent order*, where the constituent is a "group of words that functions as a single grammatical unit" (Annis, 2010-2023: 64). However, three main word orders can be depicted in Na'vi: SVO, SOV, and VSO, with the last one being the most preferred; while the other orders are rare (Annis, 2010-2023: 64). Therefore, although it has a free constituent order, the sentence structure of Na'vi recalls the most common structures in most human languages. At the same time, it is not uncommon for human languages to have free word order, take Russian, Hungarian, Japanese and many others as an example (Akmajian et. al., 2010: 152). However, as in Na'vi, in human languages free word order does not correspond to a random sentence structure, every language "inevitably has some word order constraints" (Akmajian et. al., 2010: 152). On the other hand, it is not common in human languages to have a morphosyntactic correlations in sentences, like happens in Na'vi. Indeed, it can be stated that Na'vi follows the Mirror Principle of Baker (1985), according to which syntactic and morphological structures are somehow linked in certain languages. In Na'vi, depending on syntactic choices, the position of certain affixes, such as the adjectival *-a-* or the adposition *mì+* 'in, on' (Miller, 2023: 21), can change. Here is an example of two possible word orders with the phrase "I live in Hometree", already presented in the previous sections of this chapter.

Oe kelku si mì Helutral.

1SG home do in Kelutral

(Annis, 2010-2023: 13).

Oe kelku si Kelutralmì (Miller, 2023: 70).

1SG home do Kelutral-in

This example also helps to understand the concept of a free constituent order. Here, the basic sentence structure SV(O) is maintained in both sentences; the change occurs in a functional word position, which in the case of Na'vi is indicated as an *adposition* but is referred to as a *preposition* in natural languages. Hence, considering the commonly known terms in human languages, the sentence can be divided into constituents. "Oe" represents the noun phrase, "kelku si" the verb phrase, and "mì Helutral" or "Kelutralmì" is a prepositional phrase (Akmajian et al., 2010: 170). As mentioned before, it reflects indeed the concept of "free constituent order", where the particle that refers to the proper noun *Kelutral*, which indicates the locative state in this case, can both precede or follow the noun, but can not be separated from it.

3.4 Application of Greenberg's universals to Na'vi

After exploring the main linguistic aspects of the Na'vi language, it is time to consider the application of the Na'vi language to Greenberg's Linguistic Universal. A study has been conducted by Matt Destruel titled *Reality in Fantasy: linguistic analysis of fictional languages* (2016), where he analyzed four artlangs, including Quenya, Klingon, Dothraki, and Na'vi, examining their application to Greenberg's linguistic universals. Analyzing an invented language through the lens of Greenberg's linguistic universals is undoubtedly interesting. Although they are "no longer seen as definite rules about languages" (Destruel, 2016: 32), they can still be useful for understanding the proximity of invented languages for artistic purposes to natural languages (Destruel, 2016: 32). These universal rules, presented by Greenberg in his work *Universals of Language* (1963), were considered by their author as linguistic facts common to all natural languages (Destruel, 2016: 6). They were deduced by Greenberg based on a test conducted on 30 natural languages, from which 45 universals emerged, "some of them very specific and unequivocal, others appearing as more of general guidelines" (Destruel, 2016: 32). From

Destruel's analysis, it emerged that, unlike the languages Quenya and Dothraki, which adhere to a large part of the rules considered, the Na'vi language adheres to only 5 of Greenberg's universals and disproves one. As mentioned by Destruel, Na'vi "adheres to a little over 10% of Greenberg's Universals" (2016: 85). The five universals confirmed in Na'vi are the numbers 29, 34, 35, 38, and 42. The others appear irrelevant, except for the 20th, which is acceptable but lacks sufficient evidence to confirm, and the 40th, which is rejected by Na'vi (Destruel, 2016: 33-84). The 29th rule affirms that *"If a language has inflection, it always has derivation"* (Destruel, 2016: 66). The confirmation of this rule was unraveled throughout this paper as well. In the morphological section, it was made clear that Na'vi has both inflectional and derivational morphology. The 34th rule has also been confirmed throughout this study, being *"No language has a trial number unless it has a dual. No language has a dual unless it has a plural"* (Destruel, 2016: 74). Indeed, it was stated that Na'vi has singular, dual, trial, and plural prefixes (*me+*, *pxe+*, *ay+*). An example of a word declined according to all the numerals can be found in table 10. The 35th universal affirms that *"There is no language in which the plural does not have some nonzero allomorphs, whereas there are no languages in which the singular is expressed only by zero. The dual and trial are almost never expressed only by zero"* (Destruel, 2016: 75). This means that singular, dual, trial forms are almost always marked by an affix, while the plurals are *always* marked morphologically (Destruel, 2016: 75). This rule is related to the 34th and is confirmed since, as has been demonstrated previously, in Na'vi the singular is always "zero" and the dual, trial and plural are always "nonzero" (Destruel, 2016: 76). The 38th universal states that *"Where there is a case system, the only case which ever has only zero allomorphs is the one which includes among its meanings that of the subject of the intransitive verb"* (Destruel, 2016: 77). This rule has been confirmed by table 12, indicating the case system, where the subjective or intransitive case has indeed no suffixes. The 42nd rule states that *"All languages have pronominal categories involving at least three persons and two numbers"* (Destruel, 2016: 83), which was confirmed by table 16, where it is possible to see three pronominal persons with four different numerals from singular to plural. From these results, Destruel concluded that the main reason Na'vi does not adhere to most of Greenberg's universals is its "free word

order”, a linguistic feature not considered in the universals (Destruel, 2016: 85). Therefore, this type of analysis does not seem functional and valuable for languages like Na'vi (Destruel, 2016: 85). However, the fact that some rules are confirmed in Na'vi "suggests that it operates like a natural language whenever Greenberg's Universals are applicable" (Destruel, 2061: 85). Destruel's final idea is that Na'vi behaves like a "*non-standard* natural language" (Destruel, 2016: 85).

CONCLUSION

The study conducted by Destruel turned out to be mostly inconclusive regarding the Na'vi language because, as he stated himself, Greenberg's Universals are not the appropriate means to explore the "naturalness" of a language like Na'vi (Destruel, 2016: 85). Furthermore, at the time of the study, the structural syntactic preferences of the language had not been openly declared (Destruel, 2016: 86), as later confirmed to be the VSO, SVO, and SOV forms (Annis, 2010-2023: 64). Taking into consideration Destruel's results, a different approach has been implemented throughout this paper, seeking the resemblance of Na'vi to natural languages in small details of the language or linguistic processes that concern it. Starting from the phonetic aspect, explored in the second chapter. Cameron has undoubtedly obtained from Frommer the desired effect of a language that sounds alien but is easy for actors to learn. Indeed, elements reminiscent of natural languages can be noticed in the phonetic system, although the overall sound is not similar to any human language (Frommer, 2020). For instance, click sounds, known as ejectives, are very common in various African languages, although they may sound distant to the Western ear (Akmajian et al., 2010: 87). A click sound can be found in English as well. Although it is not part of the phonetic system, it is used as a form of communication: the sound "tsk!", which is a "single click sound made with air rushing in between the tip of the tongue and the alveolar ridge" (Akmajian et al., 2010: 88). Furthermore, the vowels are also not far from natural ones; indeed, the vowel sounds are usually similar among all human languages (Akmajian et al., 2010: 87). Phonology, on the other hand, is a bit tricky. The most familiar aspects that emerge at a phonological level are the syllabic structure, which in Na'vi follows the most common pattern (V.CV) of natural languages (Akmajian et. al., 2010: 127), and the fact that consonant clusters follow a scale of sonority (De Dominicis, Treccani, 2010). Furthermore, Na'vi adheres to the Maximal Onset Principle, also present in English and other languages (Akmajian et al., 2010: 128-129). In addition, Na'vi presents a non-fixed stress, found in various human languages (Graffi, Scalise, 2013: 106). However, similar phonological transformations to

Na'vi are difficult to depict among human languages. Nevertheless, lenition is a common process in insular Celtic languages (Martiner, 1952: 192), including "Scottish and Irish Gaelic, Welsh, Breton, Manx, and Cornish" (Hammond et. al., 2017). Furthermore, a similar mutation can be found also at a diachronic level in the transformations of the Germanic language from its Indo-European roots, known as the First Consonant Shift or Grimm's Law. For example, the voiceless stops [p], [t], [k] became voiceless fricatives [f], [p], [h] in certain contexts (Onesti, 2002: 55). At the morphological level, it has been established that the Na'vi language aligns with the agglutinative language category, which, while rarer than inflective languages, is still discernible in some natural languages, such as Turkish (Graffi, Scalise, 2013: 67). Additionally, it should be noted that even in natural languages, there are no types that entirely belong to a category, and often different elements of various morphological typologies are combined within the same language (Graffi, Scalise, 2013: 68). Furthermore, the open-class words of Na'vi are the same as those in most languages, although function words are much more peculiar, since they are all affixes. This, however, is connected to the agglutinative nature of the language. This suggests that from a morphological perspective, greater similarity may be found when analyzing the morphology of Na'vi in comparison to another agglutinative language. Other small similarities or resembling details have emerged at the morphological level, such as verb aspect, the case system, and the general presence of morphological processes common in natural languages, including inflection, derivation, and compounding (Graffi, Scalise, 2013: 124). On a syntactical level, it has been clarified that, although Na'vi has a free constituent order, three sentence structures are preferred, corresponding to the most common formations in human languages (Graffi, Scalise, 2013: 69). Lastly, on a general linguistic level, Na'vi presents numerous exceptions to its own rules, some of which have been mentioned throughout the paper, but more are described in the Na'vi Grammar (Annis, 2010-2023). This aspect recalls the idea of authenticity described by Peterson in his work (2015) and by Destruel in his study (2016). Indeed, artlangs stand out precisely because the intention behind them is to make them appear "natural and authentic", therefore including exceptions to their own rules (Destruel, 2016: 3). It is also fundamental to consider other aspects beyond the

linguistic ones, such as the presence of dialects, different registers, unique and representative cultural aspects, which add greater realism to the language. In conclusion, it can be asserted that languages for sci-fi works are designed to embody both alien and natural characteristics concurrently. After all, the *naturalness* of these languages lies in their development in an environment far distant from humanity and from any contact with human languages (Destruel, 2016: 87). Some natural elements can still be identified through a careful analysis, and probably many others would emerge from further studies; however, their prominence is deliberately restrained and counterbalanced by less realistic factors. Otherwise, the language would deviate from its inherent purpose.

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RIASSUNTO IN ITALIANO

L'obiettivo di questa tesi è esplorare, attraverso un'analisi della lingua Na'vi, le caratteristiche condivise delle lingue inventate per letteratura e cinema. In particolare, si cerca di comprendere gli elementi linguistici legati al "realismo" della lingua Na'vi. Per raggiungere tale obiettivo, la tesi inizia fornendo un'ampia panoramica sulle lingue inventate. Mentre le lingue che gli esseri umani conoscono o apprendono durante la loro vita sono il risultato di processi storici naturali (Peterson, 2015: 26), esistono lingue create interamente dalla fantasia umana (Libert, 2018: 1). Queste lingue sono categorizzate in base alle loro origini e scopi. La prima categoria comprende lingue a priori (Lo Bianco, 2004: 8), che non si ispirano a nessuna lingua reale, e lingue a posteriori, che invece si basano su lingue naturali esistenti (Libert, 2018: 1). La seconda categoria, invece, include le lingue segrete (Bausani, 1974); le lingue d'ingegno, sviluppate per dimostrare un'idea scientifica (Peterson, 2015: 29), come le lingue filosofiche (Peterson, 2015: 26); le lingue universali o ausiliarie, create per facilitare una comunicazione comune tra gli esseri umani (Lo Bianco, 2004: 14); e le lingue artistiche, prevalentemente create in contesti letterari e cinematografici (Peterson, 2015: 29) o per passatempo. A partire dalla categorizzazione delle lingue inventate è possibile, inoltre, fare una panoramica storica. Principalmente a tale scopo viene in aiuto l'opera di Bausani del 1974 *Le lingue inventate. Linguaggi artificiali, linguaggi segreti, linguaggi universali*. Egli, infatti, fa un'accurata ricostruzione dell'invenzione linguistica, a partire da tempi più antichi fino al XX secolo. Accenni di invenzione linguistica erano presenti già in antiche popolazioni tribali, in cui aveva un forte legame con concetti di magia e religione, come per la creazione di formule magiche o giochi linguistici (Bausani, 1974: 50-59). Una delle prime vere e proprie lingue inventate apparve dopo la fine del Medioevo, il Bailabalan: una lingua sacra che nacque nel mondo islamico (Bausani, 1974: 96). Successivamente si diffuse la necessità di ricercare una lingua universale, ruolo fino ad allora ricoperto dal latino, che tuttavia stava iniziando a svanire (Bausani, 1974: 98). La ricerca di una lingua universale portò inizialmente alla nascita di lingue filosofiche a priori (come il *Solresol*), che però vennero superate dalle lingue universali o ausiliarie a posteriori per via della loro praticità, tra di esse si distinse l'Esperanto (Bausani, 1974:

98-121). Insieme all'interesse per le lingue universali, si diffuse nel 1900 anche un forte interesse per lingue inventate per scopi artistici (Fimi, Higgins, 2017: 24). Tali lingue svolgono un ruolo fondamentale in contesti letterali e cinematografici, poiché accompagnano l'aspetto fantastico o alieno generato dal world-building delle realtà fittizie protagoniste (Fimi, Higgins, 2017: 22). Per quanto anche la creazione di lingue per l'arte possa essere fatta risalire a tempi antichi, i primi esempi rilevanti emersero in contesto letterario in romanzi utopici o di avventura, come *Utopia* di Thomas More (1516) o i *Viaggi di Gulliver* (1726) di Swift (Fimi, Higgins, 2017: 22-23). La vera espansione, tuttavia, la trovarono appunto nel XX secolo, grazie al lavoro di J. R. R. Tolkien, che non solo creò le lingue inventate per i suoi romanzi, tra cui i più famosi // *Signore degli Anelli* (1954-1955) e *Lo Hobbit* (1937), ma scrisse anche un manuale teorico sulle lingue inventate per letteratura: *A Secret Vice* del 1931 (Fimi, Higgins, 2017: 25). A partire dalla fine del XX secolo si diffuse la pratica di assumere linguisti e persone specializzate nell'invenzione linguistica per creare lingue per opere fantasy o fantascientifiche (Fimi, Higgins, 2017: 26). Tra gli esempi più eclatanti, tra gli anni '80 e il 2000, vi sono Marc Okrand, che inventò il Klingon per *Star Trek*, David J. Peterson, inventore del Dothraki per la serie televisiva *Game of Thrones*, e Paul Frommer, che inventò la lingua Na'vi per il film *Avatar* del 2009 (Fimi, Higgins, 2017: 26). Peterson in particolare ricopre un ruolo centrale poiché non ha inventato solo una lingua, e in più ha pubblicato una sorta di "guida all'invenzione linguistica" intitolata *The Art of Invented Languages* (2015). Da tale testo è possibile trarre diverse caratteristiche delle lingue inventate per scopi artistici, con cui sono concordi altri inventori e linguisti (Academy Originals, 2016). Una delle caratteristiche principali che devono presentare le lingue per contesti di *fiction* è il concetto di autenticità della lingua, quindi il fatto che la lingua debba risultare reale nel contesto in cui viene parlata (Peterson, 2015: 24; Destruel, 2016: 3). Ciò può essere rappresentato attraverso la creazione di regole grammaticali complesse, accentuato da eccezioni alle regole stesse (Destruel, 2016: 3), o attraverso la creazione di vere e proprie famiglie linguistiche, come nel caso di Tolkien (Peterson, 2015: 18). Il concetto di realistica, tuttavia, non va confuso con la necessità per certe lingue inventate, soprattutto per contesti fantascientifici, di presentare una natura

“aliena” e sconosciuta all’orecchio umano (Adams, 2001: 112), come nel caso del Klingon o della lingua Na’vi.

Altro aspetto senz’altro peculiare legato alle lingue inventate per letteratura e cinema è legato alla fama che ottengono grazie a Internet, come è avvenuto ad esempio per il Na’vi, protagonista d’interesse in questo studio. Come si nomina nel secondo capitolo, infatti, il successo del film e, di conseguenza, della lingua Na’vi è stato un fattore essenziale per l’espansione della lingua nel tempo e perché la si mantenesse aggiornata (Frommer, 2014). In generale, le cosiddette *artlangs* constano di vere e proprie *community* online, all’interno delle quali esse vengono utilizzate come principale mezzo di comunicazione tra i vari membri.

Passando concretamente alla lingua Na’vi, è stato possibile ricostruirne il processo di creazione da parte di Paul Frommer, grazie al ricorso a interviste e ai manuali online a disposizione degli appassionati. Prima, però, è stato importante soffermarsi sull’aspetto culturale della popolazione dei Na’vi. Difatti, ed è un aspetto comune a tutte le *artlangs*, la cultura svolge un ruolo centrale nella creazione di tali lingue ed è il primo aspetto preso in considerazione nel momento di “creazione artistica” (Academy Originals, 2016). Nella cultura Na’vi emerge in maniera prominente il loro profondo legame con la natura, oltre che fisico anche spirituale: si racchiude, infatti, nella figura di *Eywa*, una sorta di divinità che comprende tutto il creato (Wilhelm, Mathison, 2010: 25-27). I Na’vi, infatti, vivono in un pianeta (o meglio su una *luna*) rigoglioso, che gli esseri umani tentano di distruggere, alla ricerca di un minerale prezioso chiamato *unobtanium* (Wilhelm, Mathison, 2010: 4-5). L’aspetto culturale dei Na’vi emerge in diverse espressioni linguistiche e proverbiali, di cui sono presenti svariati esempi nel secondo e nel terzo capitolo (paragrafo 2.1.3). Per quanto riguarda la parte linguistica, l’idea della lingua nacque inizialmente al regista James Cameron, che conì diverse parole prima di assumere il linguista Frommer per creare la lingua nella sua interezza (Frommer, 2020). Tali parole avevano, secondo Frommer, un “gusto polinesiano”, che venne in parte mantenuto. Cameron, difatti, aveva diverse richieste per quanto riguardava la lingua, in particolare i suoi suoni. Quindi Frommer si impegnò a soddisfare le sue richieste. La lingua doveva presentare suono *alieno* agli umani nel suo complesso, ma non doveva

essere esageratamente complessa da imparare e pronunciare per gli attori (Frommer, 2020). Per prima cosa, quindi, Frommer si occupò dell'aspetto fonetico della lingua, ideando un insieme di suoni, alcuni tra cui comuni a lingue naturali, la cui combinazione, tuttavia, dona alla lingua un carattere estremamente peculiare. Una delle caratteristiche che saltano di più all'occhio è la presenza di suoni eiettivi [px, tx, kx] e di suoni definiti "pseudovocali", poiché hanno l'aspetto di doppie consonanti, ma sono in realtà suoni sonanti [l:], [r:]. Inoltre, mentre gli aspetti fonologici e morfo-sintattici vengono trattati nel terzo capitolo, viene presentata nel secondo una panoramica dei processi di invenzione delle parole. In diverse interviste Frommer afferma che per il film si è limitato a tradurre le parole e le frasi che risultavano necessarie nello script (Frommer, 2010b), generando così un vocabolario limitato di parole. Tale vocabolario venne poi espanso negli anni anche grazie all'intervento e alle richieste dei fan. I principali processi di creazione di parole sono la derivazione, la composizione e, in certi casi, il prestito (Frommer, 2020). Anche di questi vengono presentati degli esempi nel secondo capitolo (paragrafo 2.2.2; tabella 4). Oltre a metodi scientifici, tuttavia, Frommer ha ricorso anche "all'orecchio", creando parole in base alle combinazioni di suoni che si accostavano meglio (tabella 5).

A partire da varie informazioni raccolte nei primi due capitoli, è stato possibile dedurre le caratteristiche che accomunano lingue inventate per contesti fantascientifici e della lingua Na'vi in particolar modo. Ne emerge, come prima menzionato, un contrasto tra realismo e alienità, che viene gestito e bilanciato a livello linguistico. Il terzo capitolo si propone di andare alla ricerca di quelle caratteristiche che, in una lingua aliena, richiamano al realismo delle lingue naturali. Innanzitutto, è risultato ancora una volta fondamentale soffermarsi sul lato culturale, dove tra gli aspetti realistici emerge la presenza di giochi di parole nei proverbi (tabella 6), la presenza di dialetti nella lingua (Frommer, 2018), così come di differenti registri (Annis, 2010-2023: 67). Da un punto di vista linguistico, invece, viene fatta una panoramica delle principali regole e caratteristiche dei tre campi linguistici: fonologia, morfologia e sintassi. Per quanto concerne la fonologia, si guarda alla struttura sillabica, che segue regole specifiche (Annis, 2010-2023: 10), riassunte nel grafico (b). A partire da tali regole è possibile notare

come la lingua Na'vi segue una propria scala di sonorità nei gruppi consonantici a inizio sillaba. Per quanto riguarda la divisione sillabica, il Na'vi predilige la formula V.CV (Annis, 2010-2023: 11), il che fa emergere due aspetti interessanti: da un lato segue il *Maximal Onset Principle*, per cui si scelgono più consonanti a inizio sillaba che seguano la scala di sonorità (Akmajian et al., 2010: 128-129), e dall'altro presenta per lo più una sillaba aperta, che termina quindi con il nucleo vocalico e tende ad evitare la coda consonantica (Bertinetto, Treccani, 2011). Per quanto riguarda l'accentazione, invece, è libera, non segue regole specifiche e, solitamente, non è graficamente marcata. Questi aspetti sono seguiti da una panoramica delle trasformazioni fonologiche del Na'vi, tra cui, fra tutte, spicca la lenizione: un processo in cui alcune consonanti a inizio di parola subiscono una trasformazione di "spirantizzazione" (Martiner, 1952: 192), in cui i suoni "perdono forza". Nel Na'vi, ad esempio, le eietive /px, tx, kx/ diventano le occlusive /p, t, k/; quest'ultime, a loro volta, subiscono lenizione diventando le fricative /f, s, h/, così come l'affricata /ts/ diventa /s/ (Annis, 2010-2023: 13). Anche l'occlusiva glottidale subisce tale processo, scomparendo (tabella 7). Questa trasformazione consonantica è causata da determinati prefissi (Annis, 2010-2023: 13). Tale processo è similmente presente in lingue celtiche (Martiner, 1952: 192) e certi processi diacronici delle lingue germaniche (Onesti, 2002: 55). Ulteriori trasformazioni fonologiche sono menzionate in seguito, come la contrazione vocalica, la contrazione "pseudo-vocalica" e l'elisione, nonostante ce ne siano ulteriori. Tutte, tuttavia, risultano irrilevanti nella ricerca della "naturalità" della lingua Na'vi. Dal punto di vista morfologico, vengono esaminati diversi aspetti della lingua Na'vi. Innanzitutto, è possibile affermare che il Na'vi appartiene alla tipologia morfologica agglutinante, poiché ogni parola presenta "tanti affissi quanti sono gli aspetti grammaticali che rappresenta" (Graffi, Scalise, 2013: 59-66). Vengono messi in evidenza diversi aspetti grammaticali: le classi di parole, i pronomi (tabella 16), i prefissi numerali (tabella 10), il sistema dei casi (tabella 9 e 12), e così via. Inoltre, viene analizzato come il Na'vi incorpori sia morfologia flessiva che derivazionale, entrambe espresse attraverso prefissi o suffissi, oltre che mediante infissi verbali nella categoria flessiva (tabella 13-15). La prefissazione o suffissazione, in generale, non è legata a regole specifiche; più semplicemente, ogni affisso ha uno specifico ruolo o posizione,

che in certi casi può variare a seconda dell'ordine di frase scelto. Infatti, il lato sintattico è peculiare perché il Na'vi presenta un ordine libero di parole, o meglio di costituenti (Annis, 2010-2023: 64). Ciononostante, sono tre gli ordini di frase preferiti e più comunemente usati nel Na'vi, corrispondenti a quelli più comuni nelle lingue naturali (Graffi, Scalise, 2013: 69): SVO, SOV e VSO (Annie, 2010-2023: 64).

Infine, tenendo in considerazione tutti gli aspetti analizzati, è stato preso in analisi lo studio di Matt Destruel (2016), il quale ha tentato di applicare le leggi universali di Greenberg a quattro lingue inventate, tra cui il Na'vi. Dai suoi risultati è emerso che solo il 10% degli universali trova corrispondenza nel Na'vi, facendolo risultare come una lingua "volutamente lontana dalle lingue naturali" (Destruel, 2016: 85). Tuttavia, come è emerso da diversi elementi del corrente studio, esistono diverse corrispondenze nel Na'vi alle lingue naturali, sia da un punto di vista linguistico che culturale, per quanto siano controbilanciati da altrettanti elementi particolari e alieni. Si può concludere che Frommer ha raggiunto gli obiettivi prefissati nella creazione della lingua Na'vi: farla sembrare aliena all'orecchio umano, ma pronunciabile e studiabile, rendendola, così, una lingua *autentica*.