Sci-Fi Neologism Translation: A Conceptual Blending Theory Perspective

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Abstract—Neologisms are ubiquitous in language, providing definitive evidence suggesting that humans can use language in a flexible and creative way. Science fiction (sci-fi) neologisms are the lexical manifestation of the creators' creativity, to which Conceptual Blending Theory constructs a solid theoretical basis. This paper finds that applying Conceptual Blending Theory to translation will provide new insights into sci-fi neologism translation. When there is no corresponding frame in the input spaces of the two languages, translators can choose to project the original word directly into the blended space or construct a new frame in the target language space. When the same or similar frames exist in the two input spaces, translators can directly map the original word to the target language space or adjust the frames according to the translators' experience, knowledge system, and target language culture to generate an optimal translation.

Index Terms—sci-fi neologism, lexical creativity, Conceptual Blending Theory, cognitive translation, translation strategy

I. INTRODUCTION

Language contours the way we think, and, in turn, our unconstrained thoughts expand the limits of language. It seems that the human's creative mind can conceive new ideas and endow language systems with unlimited potential to conjure up new expressions that have never been seen elsewhere. Words, atoms of the system, are imbued with meanings that reflect extra-mental entities. The formation of a new word can not only witness the development of the human world but also empower us to share imaginative ideas (Adger, 2019, p. 15).

With the development of science and technology and the deepening of human understanding of the world, we constantly discover new things, create concepts that go beyond the direct reflection of objective reality, and find appropriate linguistic vehicles for them (Wen, 2018, p. 107), where sci-fi neologisms may be more challenging to understand and translate than other novel words. On the one hand, sci-fi neologisms are not direct reactions to objective reality so that translators may lack the related concepts or experience structures, resulting more or less in conceptual gaps. On the other hand, since sci-fi neologisms are the works of the authors' creative manipulation of the existing language elements, they cannot be found directly in the target language, which may lead to lexical gaps from the translator's perspective.

Thanks to the development of Cognitive Linguistics in the 1970s, the study of the relationship between mind and language progressed from philosophical speculation to comprehensive theoretical and empirical studies of psychology and physiology, which prepared the conditions for the revelation of the cognitive mechanism of language creativity and translation. Cognitive Linguistics clearly states that language is the externalization of our internal structures, so its creation, understanding, and translation can be explained through human cognition (Lakoff & Johnson, 1980). The ideas of Cognitive Linguistics also shed light on the field of Translation Studies and have brought about fruitful results. Traditionally, translators focus on the equivalence on a textual level and ask for a description of the source text when encountering a lexical gap. When referring to Cognitive Linguistics, translating a coinage requires an in-depth analysis of the translator's cognitive operations, whereby Conceptual Blending Theory is brought to the fore because it is a practical approach to integrating conceptual systems that have not been previously connected (Vo & Cater, 2010, p. 314), endowing it with high explanatory power for the creation of new structures.

This article first outlines the concept of science fiction and sci-fi neologisms. It then focuses on how sci-fi neologisms are conceptually integrated during the process of creation and translation based on Conceptual Blending Theory. Finally, the article proposes different sci-fi neologism translation strategies from a mental network perspective. Hopefully, this study may hasten the development of Cognitive Translation Studies, a rising discipline that encompasses paradigms probing cognitive science and traditional translation studies (Wen & Xiao, 2019), and shed light on the future translation practice of science fiction or other related literary genres.

II. SCI-FI NEOLOGISMS

A. An Overview

Science fiction reflects on technological advances and social development, considers how they can alter human living situations, and redefines what it means to be human. As a literary genre describing changes and progress encountered

by humankind, it is a web that elaborately interweaves reality and the author's imagination with the elements of estrangement and alienation. The Concise Encyclopedia of Britain, Volume IV, defines *science fiction* as a literary genre developed in the 20th century based on the actual or imagined discoveries of scientific theories. As Isaac Asimov puts it, science fiction is a branch of fiction that deals with human reactions to advances in science and technology. Since there is a gap between reality and the possibility of actualizing the authors' ideas, this literary genre puts fictional *novum* to the fore (Aloisio, 2019, p. 2), so sci-fi stories cannot be expressed in everyday vocabulary. According to Csicsery-Ronay's (2008) seven beauties of science fiction, fictive neology, the most perceptible by the audience, leads the list. Sci-fi neologism is not a mere window-dressing in science fiction but a representative creative technique of the genre, which displays the science fiction identity and takes on the role of stylistic signature (Westfahl, 1992, p. 223). Since new words are frequently used in the first moments of encounter with a strange new world, we can get a rough notion of the nature of new concepts in science fiction by studying the nature of neologisms (Westfahl, 1993, p. 291).

In accordance with the above description, we can tentatively define *sci-fi neologism* as a fictional word created by sci-fi authors based on the objective world and scientific knowledge, even if it may completely contradict existing common knowledge. At the conceptual level, these words often have no referent in the real world, and at the lexical level, obscure as they may be, sci-fi neologisms are primarily variants of existing lexical forms. Referring to Rey's (1995, p. 68) categorization of neologisms, sci-fi neologisms can be mainly allocated to new coinages, formal neologisms, and semantic neologisms. New coinages refer to completely made-up words, like "kipple" in *Do Androids Dream of Electric Sheep*, meaning auto-replicated garbage. Formal neologisms, which are coined through existing vocabularies, consist of abbreviations and derivatives. Abbreviations indicate the extraction of certain letters in a primitive word (e.g., "precog" derived from precognition in *The Three Stigmata of Palmer Eldritch*), and derivatives are coined by adding affixes, taking "replicant" in *Do Androids Dream of Electric Sheep*, signifying artificial human beings, as an example. Semantic neologisms comprise blendings and compounds: Blendings comprise parts of two words. For example, "chrononaut" (chrono plus astronaut), a neologism in *A Little Something for Us Tempunauts*, signifies time travelers, and compounds are coined by the combination of two or more words, taking "fluke-pit" in *The Days of Perky Pat* as the example, which refers to the underground shelter for survivors.

Besides sci-fi neologisms with a distinct linguistic structure, they may appear directly in the form of an existing word, acquiring new meanings in a new context, and some proper nouns may even be divorced from their original referents and take on new denotative meanings (Jiang, 2012, p. 57).

B. The Translatability of Sci-Fi Neologisms

Translating neologisms is probably the biggest challenge for translators (Newmark, 2001, p. 140). Languages can look very different when judging superficially from the perspectives of phonology and morphology, but a deep analysis may lead us to an opposite viewpoint, stating that languages actually have common designs or patterns, and their creation may share basic principles.

The world can be the source of all inspiration, whether scientific or literary creation. We are in this shared objective world and feel the sensory stimulation it gives us, which eventually leaves an imprint on our mental network. The way languages work is closely related to human embodied experience, and it is what language users hear or see throughout their lives that shapes the structure of languages (Adger, 2019, p. 4). According to Lakoff and Johnson (1999, p. 37), humans' conceptual system is critically anchored to our perception, body movement, and experience in the physical world, and we can further refine pieces of our experiences to a structured system of language. As humans have similar physiological structures and face the same objective world, we share universal natural laws and have similar perceptual and cognitive pathways, making different languages operate in similar ways, and this similarity makes the translation between languages possible.

Despite a sense of otherness, sci-fi neologisms cannot exist apart from reality. They are a fusion of imaginary ideas with different elements from reality, a combination of the experience and imagination of their creators. Sci-fi authors envision a fictive world in their minds, but deep down, the imaginary world is constructed on top of the natural world. For example, Mary created "Frankenstein" at the time when electricity was in full bloom; concepts created by Verne, including moon landing and space flight, have become a reality; and Herbert's *Dune* reflects the various threats and fears brought to society by the development of technology and society in the 20th century. Those examples demonstrate that sci-fi ideas are not just hare-brained fantasies, a depiction of something unknown, but the reasoning and prophecy of scientific research and social development.

III. BLENDING IN WORD CREATION AND TRANSLATION

A. Conceptual Blending Theory

In the 1990s, Fauconnier and Turner proposed Conceptual Blending Theory, which provides a powerful explanation for innovative thinking and the production of new concepts. Following this, they develop a complete conceptual integration network. As Figure 1 illustrates, the network consists of four conceptual spaces: input space I, input space II, generic space, and blended space, wherein elements in input spaces are selectively projected into the generic space and form an emergent structure in the blended space. The integration suggests not only a simple mapping of elements across

spaces and their projection but also a process where new elements are formed and new meanings are constructed (Li & Sun, 2021, p. 91).
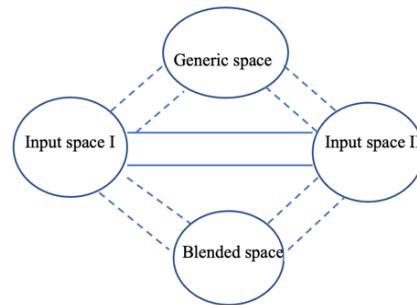

Figure 1. Basic Model of Conceptual Blending

The emergent structure is a result of the mental manipulation of material forms, and the innovative meaning it carries is not simply the sum of the projected elements (Wang, 2009, p. 56). For example, in the Middle East, a type of vehicle is called "ship of the desert", where the elements "desert" and "ship" come from two different conceptual domains. However, once they are mapped and integrated, the novel meaning of a fast-moving vehicle in the desert can be obtained.

Conceptual blending refers to a psych-spatial network, and Fauconnier and Turner (1998) analyze how conceptual integration can blend frames, whereby they put forward four types of conceptual integration networks. A simplex network is a conceptual integration network in which one input space has an abstract frame, and the other has elements to fill the frame. For example, in "John is Mary's brother", input space I contains a blank "sibling" frame, while input space II contains the elements "John" and "Mary". After a simple mapping across spaces, the elements of input space II are filled into the blank frame of input space I. In a mirror network, two input spaces share the same frame, and they are both inherited in the blended space. For instance, the two input spaces of "Chris is left speechless under Moran's questioning" have the same "debate" frame, which forms an emergent structure that suggests "Moran trumps Chris". A single-scope network consists of two input spaces with different frames, and one is projected into the blended space. Taking "Lenovo strikes hard at Dell" as an example, input space I has the frame of a boxing match and input space II a commercial war, and, from the emergent structure, the audience can perceive a bloody commercial battle. In contrast, blended space contains parts of both frames in a double-scope network, making the network highly innovative and generating novel meanings. The famous example "the surgeon is a butcher" displays two different frames, namely surgeon-patient and butcher-animal frames, and a conceptual integration leads to an emergent structure: the surgeon operates poorly.

Thus, we can conclude that no new concepts are created at a single leap, and every ingenious creation is a cognitive outcome of a series of mental activities. Through the projection and integration of different frames, one can create new meanings, and by projecting different elements of the frame, the same concept can be expressed in different ways.

B. Conceptual Blending in Sci-Fi Neologism Creation

Every concept is scalable (Stockwell, 2016, p. 222), even those carried by sci-fi neologisms. Their prophetic nature may integrate science, sociology, philosophy, history, and literature into one, which fully and profoundly reflects the real world we live in and the way the creator sees it. The creation of neologisms goes on par with the development of the external environment, and the world provides the stimulus and inspiration for lexical creativity. In line with the idea of constructivism (Piaget, 1972) and social constructivism (Vygotsky, 1987), we rely on our mind to shape ideas of the world, both physical and social, we experience. We simulate the original perception of the world and recreate it in our mind, resonating with our experience, schematic knowledge, and personal judgment, which locate us forward in a positioning that shapes our focus of perception.

The creative construal of the physical world provides a portal but an insufficient stimulus to account for the activation of a new concept, and it still necessitates careful processing and integration by the human mind. Neologisms are fundamentally reflections of humans' cognitive activities at the lexical level, and their formation is associated with the creator's experience and knowledge system (Langlotz, 2016, p. 40). According to Fauconnier (1997), constructing a new meaning involves the formation of mental spaces and the mappings between them. Thus, analogically, a new concept carried by a sci-fi neologism can be conceived by a blend of real-world experience and the creator's creative vision.

The model yields the potential to generate infinite meanings from our existing knowledge and capacity of imagination. When we think and construe, we set up mental spaces, from which mutual information shared with our creative inspiration is extracted. Afterward, a further projection from the input spaces generates the blended space, giving rise to a new structure that carries a new meaning that never exists in either of the input spaces.

Figure 2 illustrates a comprehensive cognitive process for sci-fi neologism creators. Word creators weave new concepts based on their perceptions of the world and combine them with their personal experience, creativity, and

imagination. After the new concept is formed in their mind, they develop an appropriate lexical carrier to satisfy their desire to express. Therefore, they must carefully parse the new concept, find corresponding lexical elements, and manipulate them to construct a new vocabulary.

Portrayal ⤑ Blending ⤑ Construction

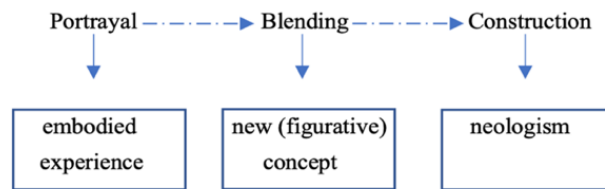| embodied experience | new (figurative) concept | neologism |

Figure 2. Cognition Path of a Word Creator

Sci-fi neologisms may seem unrealistic, but they essentially signify new insights into how an author observes things and reflect his or her attitude toward the world (Liberman, 2009, p. 34). The role name in *The Handmaid's Tale* offers a good example. In the novel, Margaret Atwood builds a patriarchal society where women are subjugated. The creative inspiration of Atwood can be found in her unsatisfying attitude towards women's status in the US during the 1980s, which serves as the prominence of her focus on the world she lives in. After spotting the stimulus, Atwood starts with her creation. The "blending" here suggests a fusion of the real world and the author's satirical view of it, which helps shape the imaginative and dramatized world in the novel. Under the setting of the world she builds, where fertile women are assigned to distinguished men, she needs new words suitable for the context, so the protagonist's name, "Offred", is coined. "Fred" is a familiar name in English for males, and the preposition "of" signifies a sense of subordination, and thus the name highlights the master-slave relation between the protagonist and her superior named "Fred", which displays the implicated meaning and sarcastic effect adequately.

In conclusion, the creation of neologisms reflects both the creators' construal of reality and excellent wording capacity. They are good at observing the world and have rich imagination and analogy skills, and their proficient language capacities also contribute to the creation of impressive or informative neologisms that can be understood and accepted by the audience.

C. Conceptual Blending in Sci-Fi Neologism Translation

Being able to understand the construction and conception of a neologism is a good start, but its translation may be the most challenging hurdle to overcome. In the translation of sci-fi neologisms, there are potential lexical gaps and even conceptual gaps between two language systems, and thus it requires a thorough understanding of the neologism's context and structure before translators can render them into the target language.

When unfolding neologisms, cognitive construction can be found behind the scenes, where links are forged and emergent conceptual structure appears. Thus, translating neologism necessitates manipulation on a cognitive level. The translator must take into account the author's cognitive process and the rationale behind the linguistic structure, i.e., the conceptual knowledge, embodied experience, and semantic function (Wen & Xiao, 2019, p. 7), and, referring to the procedure of conceptual blending, map the source language into the target language based on his/her experience.

Compared with how creators invent neologisms, translators follow similar cognitive paths during their translation process. Figure 3 presents how translation can also be a process of blending. The first thing a translator is exposed to is neologisms, and there is no semantic representation in their mind by then. Thus, the translator engages first in the process of deconstruction, where the meaning of a novel word can be activated by unpacking its linguistic structure, and some seemingly discordant letter or character combinations may be acceptable by restoring its primitive structures and making resonance with their respective meanings (Wang, 2009, p. 58). Besides its superficial structure, the word works as an instruction for reproducing the concept. Thus, the translator also needs to unscramble the train of thoughts of the creator via encyclopedic knowledge and embodied experience. In the next phase, the translator needs to blend appropriate elements on both linguistic and mental levels to develop an emergent structure via completion and elaboration (Wang, 2009), which eventually leads to the translation product.

| experience & context | translation | neologism |

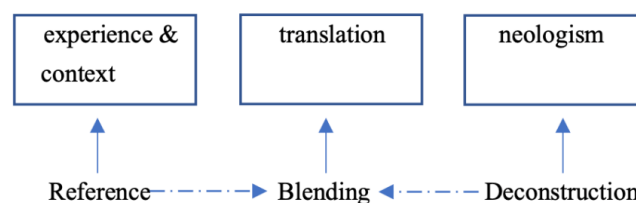Reference ⤑ Blending ⬅ Deconstruction

Figure 3. Cognitive Model of the Translator

Being able to provide an impressive translation of a neologism necessitates certain flexibility, and the translator should bring similar effects to the target audience as the original audience (Nida, 1964). A typical example is the translation of a name in *The Star My Destination*. The author constructs a world where people can move instantly through the power of thought, and the first person to have this power is called "Jointe". An experienced translator will instantly notice that the word "joint" itself has the meaning of connection, and the context offers the key to the subtlety of the name. In contrast to direct transliteration, the translator chooses to externalize its meaning and create the name "斯东". This translation fits the Chinese readers' cognitive habits and is also a homophone for the word "思动", which means to move through thought (Jiang, 2012, p. 58).

IV. TRANSLATION STRATEGIES OF SCI-FI NEOLOGISMS

Translation has long been considered a mere reproduction of what already exists in the source text with a stock of ready elements in a new linguistic and cultural system (Hewson, 2016, p. 12). However, based on the distinctiveness of neologisms, traditional translation strategies that emphasize equivalence and fidelity may not be feasible, and thus new countermeasures are required (Tan, 2012, p. 29).

A. Translation on a Cognitive Basis

The process of translation requires the participation of both linguistic and contextual knowledge: the translator needs not only to understand the meaning of the words but also to make a logical deduction based on his/her knowledge structure (Chen, 2008, p. 29). On the premise that the original word's meaning is accurately expressed, the final translation will be based on the commonality of the two languages and must meet the target language's cultural requirements.

Nevertheless, different physical environments, historical experiences, and cultural contexts may lead to the formation of different cultural models so that the lexicalization of concepts may distinguish from one another (Wen & Xiao, 2019, p. 16), which impedes the translation process. Besides, people may have different understandings of the same thing due to different perspectives, thus producing different expressions. Different perspectives and focus can bring about different expressions, yet the concept they activate are closely related (Wen & Xiao, 2019, p. 130). Since the same meaning can be expressed differently, the translation of neologisms does not need to abide by formal equivalence. By drawing closer or farther from the creators' perspectives, translators can parse a word from different angles and land their focus where they can elaborate, taking advantage of their knowledge and language system. They can also create different expressions that convey similar meanings based on the norms of the target language and the predicted reader's knowledge framework (Shi, 2009, p. 60). For neologisms that do not have an objective referent, the translator can trace the language form back to its origins, imaginatively construct or restore the construal scene of the creator, and then reselect appropriate elements for the translation to turn a seemingly untranslatable word into a translatable one.

B. The Adaptability of Conceptual Blending Theory on Translation

Although Conceptual Blending Theory is not a specialized translation theory, its use as a methodological approach to examining the cognitive process of translation can lead to enlightening findings, as it explains the process of generating new structures based on existing structures from a cognitive point of view (Wen & Xiao, 2019, p. 156). The translation process is a partial mapping across two input spaces, which can be regarded as the author's and the translator's mental space presented in linguistic forms or source language space and target language space to be concise. Different neologisms correspond to different networks, and the translator can operate on an element or a frame level to generate an optimal translation in the blended space.

(a). Corresponding Mapping

Even though sci-fi neologisms have no real-world counterpart, their creation is based on things, events, or objective truths in the world. Thus, for certain neologisms, the translator does not need to process them too much to come up with a translation that suits the target language.

In a mirror network, there are corresponding frames in the two input spaces with different elements. By applying it to translation, a neologism can directly map its translation in the target language space if the two input spaces have corresponding linguistic elements, share the same denotative meaning, and activate the same cognitive frameworks in the audience of both languages (Wen & Xiao, 2019, p. 159). This strategy mainly applies to old words with new meanings, where there are no cognitive difficulties in understanding the new meaning of the neologism endowed by the new context. For example, the three-body problem is originally a basic model in celestial mechanics, based on which Liu Cixin depicts "三体世界" [three-body world], and the translator can resort to a literal translation to cover the meaning of the original word.

In addition to old words with new meanings, this approach can also be applied to some blendings and compounds if their components reflect respectively common knowledge. When no connotative meanings are created during the manipulation, the translator can directly translate the neologism to achieve the effect it conveys in the source text. For example, "Astrogation" is a word often found in science fiction, which is a combination of "astronaut" and "navigation",

and its meaning is obvious to be deduced, referring to cosmic navigation. As long as the translator can successfully infer the components contained in the original word, s/he can project them into the target language space for one-to-one correspondence and combine them to come up with a translation "宇宙航行" [space navigation]. Such a translation may lose some of its lexical novelty for the target audience, but it can best restore its meaning. Compared with blendings, the translation scenario of compounds is more straightforward. For example, in *Ghost in the Shell*, the human body and mind can interact directly with standard computers and networks, with the "geisha bot" being one of the technology's products. Although such "geishas" exist only in the imaginary world constructed by the author, based on the audience's understanding of the two components of the coinage, i.e., "geisha" and "bot" that stands for "robot", the meaning of the new word appears vividly. Therefore, such compounds can be translated by the corresponding mapping of the neologism's components in the two input spaces. Accompanying the accustomed expressions in the target culture, the translation "仿生艺伎" [bionic geisha] conforms both to the meaning accuracy and literary requirement.

In general, when the meaning of a neologism is based on the simple summation of its constituents, a direct cross-linguistic mapping will not cause difficulties in comprehension or cause a heavy cognitive load on the target audience. Since the constituents of a word activate the same cognitive frameworks in both language systems, the translator only needs to find the elements in the target language space that correspond to those in the source language space, and a direct projection into the blended space would be enough to lead to a satisfying translation.

(b). Direct Projection

In a simplex network, input space I contains an abstract frame, with no corresponding frame in input space II but only the elements to fill the frame after a simple cross-space mapping. The prerequisite for applying this strategy to translation is that a neologism has no translation equivalent in the target language space, nor can it activate corresponding representation in the cognitive frame of the target audience. In this case, the most appropriate method may be to adopt the original language frame directly, i.e., transliteration, to compensate for the gap in the two input spaces. The strategy is particularly suitable for translating new coinages, especially proper nouns.

The translator can translate coinages by directly selecting the appropriate elements from the target language space. For example, in the movie *After Earth*, aliens release a monster called "Ursas". When translating this created moniker, the translator retains its original framework and translates it as "恶煞" [evil spirit]. The translator's clever choice of elements in the target language frame not only preserves the linguistic features of the original word but also enhances the frightening prospect of the monster through the target language. In the translation of such words, the translator takes the pronunciation of the original word as the basis and, at the same time, considers the target audience's knowledge system and aesthetic interest in the imaginative referent. The target elements are selected under the premise of harmonization, and a new word is intentionally created in the unity of form and meaning.

Another translation strategy involves affixing a meaning marker based on the source language frame to specify to which category the neologism belongs. In many sci-fi novels, authors often create and name a new world in order to make the worldview in their works believable. If the name chosen by the author has no special implied meaning, the translator can transliterate it and identify the category it belongs to by adding an appropriate suffix. For example, in *Rendezvous with Rama*, Arthur C. Clarke names an artificial planet forged by extra-terrestrial beings as "Rama", which the translator can first translate phonetically to "拉玛". Since the pairing of these two characters has no specific meaning in the target language and no other cognitive frameworks can be activated, it is all served to describe the new world created by the author. Meanwhile, to reduce the target audience's cognitive load, the translator can also add the category-defining character "星" [planet] to further clarify the meaning of the coinage.

The sense of otherness is one of the most remarkable features of sci-fi neologisms, so translators should manage to avoid the loss of innovative meaning of the words caused by excessive naturalization in translation. Therefore, a direct projection of the frame from the source language space into the blended space can preserve the uniqueness of the neologisms and the reader's right to embrace the exotic culture. On this basis, the translator can externalize the meaning of the original word by appropriately selecting elements from the target language space or adding corresponding meaning markers to reduce the reader's cognitive burden in the comprehension process while promoting the activation of the same cognitive framework.

(c). Single-Scope Projection

In a single-scope network, the two input spaces have different frames, one of which can be projected to the generic space. From the perspective of translation, there are corresponding elements in input space I and input space II, but, unlike the circumstance of a mirror network, these two elements cannot activate the same imagery schema, i.e., they do not have a shared structure in the generic space. Therefore, the translator needs to escape from the original word and create a new frame in the target language space.

Such a translation strategy can be adopted when the author takes linguistic advantage. In *The Three-Body Problem*, Liu Cixin names an elegant girl in a kimono "智子", a kind of intelligent micro-particle capable of communication and investigation that later materialized into a humanoid robot. The Chinese name means intelligence in form and proton in

sound, a wordplay that a direct translation or transliteration can hardly present. In this case, a direct projection of elements from the source language space may hinder the subtlety of the neologism, and thus the translator needs to construct a frame in the target language space while making the elements in the source language space an embellishment in the generic space. To artfully fuse both implications in the translation, Ken Liu first chooses the name "Sophia", derived from Greek *Σοφία* that represents wisdom, extracts the first four letters of it, and grafts it on the last two letters of "proton" to coin the word "Sophon". After the translator's composition, elaboration, and extension, neither the sound nor the form of the original word can be traced, but its meaning is perfectly reproduced in the translation.

Besides word coinage, it is also a common writing technique in science fiction for authors to convey their ideas through existing words. However, unlike the above-mentioned old words with new meanings, sometimes these new words cannot be translated directly because the original objects they described already have a deep-rooted image in the target audience's mind, so a direct translation may activate a wrong cognitive framework and lead to misunderstanding. For such neologisms, the translator needs to create a new frame in the target language space that corresponds precisely to the original word based on the information s/her has already obtained. Taking the film *After Earth* again as an example, the human army trains "ghosts", so called because they are trained to fight without leaving a trace. However, in the target language culture, the image of "ghosts" is very different from that in the source language space, so the translator cannot translate it literally as "鬼" because it would activate a wrong cognitive framework. Instead, the translator chooses to translate it as "影子战士" [shadow warrior] via its description in the context. The translation does not originally exist in the target language space, and its innovative transformation of the imagery of "ghost" into "shadow" effectively conveys the meaning contained in the original word while avoiding unnecessary conceptual activation.

This translation strategy requires the translator to demonstrate great linguistic competence and marvelous creativity since creating a frame and projecting it into the blended space is much more complicated than searching existing elements in the target language space. The original word provides a creative idea for the translator, who, based on his/her understanding of the neologism and context, creates a different expression form that can activate the same cognitive framework in its target audience as that in the audience of the original work. In addition, the neologisms created by the translator effectively integrate the context and may greatly facilitate the audience's cognitive associations. It endows the translator with much room to play, which may easily lead to surprising translation products if the translator plays it right.

(d). Double-Scope Projection

In a double-scope network, the two input spaces have different frames, and both are projected onto the blended space, making the generation of emergent structures particularly evident and highlighting the network's creativity. In the translation process, the translator needs to cognitively manipulate the frame in the source language space to make it dovetail with the knowledge system of the target audience, and the versatility and hierarchy of a frame make the translator's manipulation possible. The translation produced through the double-scope network preserves the original word's form and incorporates the target cultural characteristics. With reference to Bayer-Hohenwarter and Kussmaul's (2021, p. 316) cognitive shifts, three strategies, namely perspective shifts, upward frame adjustment, and downward frame adjustment, are developed.

1. Perspective Shifts

Words can be regarded as a frame that highlights individual concepts and specifies a particular perspective from which the frame is viewed (Fillmore, 1977). For example, Fillmore (1976) suggests that the difference between "coast" and "shore" can be demonstrated by the respective activation of the "continental" and "oceanic" frames. The perspective of a frame refers to the viewpoint of the observer, and thus the versatility of frames can be reflected in the translation process in shifts of the observation perspectives of what describes the original word.

Sci-fi authors often create neologisms based on their culture and experience so that these words can reflect the author's cognitive preference, and the translator can adjust the perspective of the original frame and find the cognitive perspective suitable for the target audience. For example, the coinage "Megatron", referring to the villain in *Transformers*, originally refers to the tower-shaped electron tube, from which we can deduce that the author wants to underline its intimidating power through its colossal appearance. In Chinese, the translator chooses to highlight its great oppression from its characteristics and renders it into "威震天" [power shake sky], which means an arrogance of power in the context. The same strategy is adopted in the translation of "jaeger" in *Pacific Rim*. The word itself refers to an agile bird, but here it is used to refer to the enormous human-shaped machine created to fight against the invasion of monsters. The author selects "jaeger" to emphasize the high sensitivity of these machines, whereas the translator lays emphasis on their appearance and translates it to "机甲战士" [mech warriors].

Objectively speaking, there is no optimal perspective, and it may essentially be influenced by the overall environment the observer lives in. Translators may choose to translate from different perspectives because the target

audience is accustomed to observing things from certain angles, or it is a subjective choice of the translator after a comprehensive understanding of the original word, a presentation of his or her individual cognitive preference.

2. Frame Level Adjustments

Besides versatility, frames exhibit a hierarchical structure, with an upper frame representing abstract concepts. Cultural differences in different languages may lead to the failure of correspondence between the same frame level because a concept in the source language culture may not exist in the target language culture. Therefore, the translator needs to find a correspondence between the two languages by adjusting the levels of frames.

Upward adjustment is a common strategy in translation, where a more abstract concept is used to achieve meaning delivery between two languages. For example, in *Frankenstein*, considered the world's first science fiction, the protagonist Frankenstein tries to put together a giant and make it come to life. Since then, "Frankenstein" has been commonly used to describe sapient creatures created in scientific experiments. However, in the Chinese language space, it is evident that most audience knows little about the origin of the original word, so "Frankenstein" in Chinese often corresponds to "科学怪人" [scientific monster], which is found in a broader and more abstract frame level compared with that of the original word. Similarly, in *Ready Player One*, the scarcity of materials in the world set up by the author results in a "corn syrup drought", and since corn is the main agricultural product in the American culture, the "corn drought" logically activates the corresponding cognitive framework in its original audience. Concerning its translation, simply transplanting the original word into the target language space may not achieve such an effect, and replacing "corn" with "rice" may result in over domestication. Therefore, an appropriate strategy is to find a corresponding translation in the upper frame of "corn" and translate it to, for example, "big crop reduction", which can avoid excessive domestication and accurately activate the cognitive frame of the target audience.

In addition to more abstract expressions, translators may also look for more precise translations in sub-frames of the original word. A downward adjustment of frames as a translation strategy is demanding for the translator's capacity because it requires a thorough understanding of the original word and the translator's initiative and creativity to refine and describe the neologism more precisely, which may eventually lead to an optimization of the original word (Bayer-Hohenwarter & Kussmaul, 2021, p. 317).

In some sci-fi works, the author will first name a new character or object and then enrich its characteristics with explanatory descriptions. For example, in the novelette *The Days of Perky Pat*, the idea of "fluke" is one of the main subjects. "Fluker", coined by adding the suffix "-er", describes the adults who have survived by chance the hydrogen war. According to the author, "fluker" is "an ugly word", so a translation of "余民" [remainder people] is a subtle choice. The translation is also a coinage, with "余", meaning leftover, followed by a suffixed generic noun "民"[people]. The translation covers the idea of the ugly word because it is homophonic to "愚民", which means ignorant people. In this translation, the translator conveys two meanings of the original word in one word, which may bring a better cognitive experience to the target audience.

Similarly, in *Ready Player One*, the author names a suit as "X1 bootsuit", making whoever wears it sense the physical and psychological experience in the game. Here, the translator can integrate the functional characteristics of this garment and translate it as "零触感套装" [zero-touch suit]. Such a translation does not affect the original word's meaning but somewhat clarifies the characteristics of the object it describes.

In general, the hierarchical adjustment of the framework gives the translation of sci-fi neologisms a certain degree of flexibility and gives the translator room for creativity. However, the translation of them is not arbitrary. While translators translate with their understanding and preference, they still have to reflect the theme of the work and the author's conception.

V. CONCLUSION

Sci-fi neologisms are products of human creativity that outline new worlds and concepts through the author's unique perspectives and cognitive processing. Thus, the concept of a sci-fi neologism is, to a certain extent, a combination of the author's embodied experience and imagination. Based on Conceptual Blending Theory, they project elements shared in the real and imaginary worlds into the generic space and generate neologisms in the blended space. Similarly, the translator places the neologisms in the context, combines them with his/her understanding and knowledge, and generates a translation in the blended space.

Even though sci-fi neologisms are challenging to translate, the difficulties also demonstrate great room for operation. When translators cannot find a corresponding word in the translation, they can either create new words based on the existing elements of the target language or construct an entirely new frame in the target language space. If there are corresponding elements in the target language space, translators can adopt literal translation; if the neologisms, primarily referring to proper nouns, do not carry special meanings, then translators can directly project the original frame into the blended space. In some cases, translators need to give full play to their creativity because they need to create new frames in the target language space or find the most suitable translation elements by adjusting the levels of the existing frames.

Given the complexity of linguistic phenomena, its translation is too sophisticated to be fully exploited. This article can serve as a modest spur to call for an expansion of research in this field, and future explorations can orient to cognitive impulses that prompt translators to foreground certain linguistic elements, the impact of genre varieties spawned on lexical creation and translation, and so forth. Besides, the models presented here may require further backup from empirical research, especially in terms of translation process research. The loan and compatibility of existing linguistic frameworks may be a shortcut in the development of Cognitive Translation Studies in its infancy, but within the discipline itself, its shaping-up will ineluctably require theoretical innovation and refinement.

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