Metaphoric Blending in Science Fiction
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Abstract. The argument presented in this paper is that metaphor is used in every variety of science fiction discourse to realize two very important functions derived of the register’s ontological juxtaposition of factitiousness and fictitiousness: to bring literary imagery to life (1), to cognize patterns of thought (2). The paper aims at disclosing metaphoric blending as interaction, integration and mixture of conceptual and image metaphors, in other words – as convergence of metaphorical thought and metaphorical imagination. To achieve this objective, different science fiction sources have been selected and the method of case study has been applied for the analysis of the data. The investigation has revealed that science fiction is at large motivated by the conceptual metaphor Change is motion/movement referring to human evolution and science, and its variations (Change is forward motion, Scientific/technological change is progress, Scientific/technological change is destruction, Scientific/technological progress is emotional regress, etc.), the brief, formulaic utterances of which demonstrate immense generative power going far beyond concepts, extending into a large variety of complex image metaphoric associations on any idea or activity expressible in language and aiming at revealing new aspects of life through creative means. Hence, the present investigation is a case study that focuses on the typicality of interrelatedness of metaphor as a phenomenon of language and metaphor as a phenomenon of thought. My assertion will be that the latter dichotomy is not only an important peculiarity that offers useful insights into the study of metaphor but also testifies to broad cultural transformations as part of the cognitive revolution of our information age.

Key words: metaphorical blending, conceptualization and metaphoricity, conceptual and image metaphors.

“All fiction is metaphor. Science fiction is metaphor. What sets it apart from older forms of fiction seems to be its use of new metaphors, drawn from certain great dominants of our contemporary life – science, all the sciences, and technology, and the relativistic and the historical outlook, among them. Space travel is one of these metaphors; so is an alternative society, an alternative biology; the future is another. The future, in fiction, is a metaphor” (Ursula K. LeGuin, 2000, p. 4).

Introduction

The traditional theory of metaphor emphasizes the distinction between literal language and figurative/stylistic selection, and also assumes, to some extent, an interdependence of cognition and style in metaphorical representation (Orwell, 1968). After Lakoff and Johnson pioneered the cognitive theory of metaphor and criticised the traditional view for ignoring conceptual patterns and presenting metaphor only as a stylistic ornament (1980), a number of metaphor theorists and cognitive psychologists started mostly to rely on formal logic with its central analogy of the mind/brain as computer (Low and Cameron, 1999, p. 8) and many trends in metaphor study were marked by a reduction of the study to conceptual content, thus underemphasising the metaphor’s linguo-stylistic features, as well as the interrelatedness of the cognitive and the imaginative aspects in discourse. However, considering that most recent developments in metaphor study tend to join the cognitive and the rhetorical within metaphor (Kittay, 1987, p. 6) and that

“historical overview points to two key areas for development in the theory of metaphor: the need to go beyond the Information Processing Paradigm and the need to re-establish language focus in metaphor research”,

the time has come to push the “epistemological base to its limits” and to take into account “language, thought and interaction” (Low, Cameron, 1999, p. 5).

According to Low and Cameron (1999, p. 8), it is important for a researcher to decide early in the research process which of the three perspectives of metaphor: metaphor as a phenomenon of language (1), metaphor as a phenomenon of thought (2), metaphor as a phenomenon of both language and thought (3) is being applied and then consider the implications of that decision. Considering that metaphor, “a device for seeing something in terms of something else” (Burke, 1969, p. 503), is used in every variety of science fiction discourse to realize two very important functions derived of the register’s ontological juxtaposition of factitiousness and fictitiousness: to cognize patterns of thought (1), to bring literary imagery to life (2), the third perspective suggested by Low and Cameron seems to be the fittest approach to the study of metaphor in science fiction. The questions Only in science fiction? or Why not in mainstream fiction? are besought here. The answer is that in mundane fiction there may and will be cognitively banal or empty but emotionally strong creative metaphors which make a strong aesthetic impact on the reader, whereas in science fiction all imaginative metaphors are, to a certain extent, related to cognition. This conversion of imagination and cognition is the direct reflection of the reason vs. emotion interaction which is undeniably a must for science fiction as a discourse. The terms

intellective/epistemic/rational/speculative/scientific fiction or imagination intermingled with scientific fact, speculative imagination, imaginative speculation, logical extrapolation, reasoned extrapolation, logical imagination
used by science fiction authors and researchers to define the genre, characterize it as a discourse based on the ontological dichotomy of fact and fiction; a dichotomy which is directly reflected in science fiction metaphor.

My central concern will be offering an adequate theoretical frame for science fiction metaphor by analysing and interpreting metaphorical blending, or, more precisely, the mutual reciprocities between the two types of metaphor (conceptual and image) as a reflection and realization of the ontological juxtaposition of reason and emotion. My proposition will be that the latter dichotomy is not only an important peculiarity of the given genre, but also that it testifies to broad cultural transformations of our information age.

Convergence of Concepts and Images

A closer look into the theory of metaphor makes it apparent that the literary/image/impact/creative metaphor is often discussed contrastively to the cognitive/conceptual/conventional metaphor. The latter is considered to be not only deeply rooted in our cognition, and absolutely central to it, but also “automatic” in the sense that it has, over time, become part of ordinary language to such an extent that we are not even aware that we are using a metaphor. Furthermore, the cognitive view of metaphor sees it only as a cognitive instrument which is fundamental in conceptualising the world around us. Conceptualization functions through metaphor mapping across conceptual domains or “semantic fields” (Kittay, 1987); from the source domain, which is usually concrete, to the target domain, which is usually abstract (Lakoff and Johnson, 1980, 1999). The target concept usually derives from the source concept, and to understand the metaphor, the mapping applied to source-target pairing and the discursive and stylistic influences that bear upon mapping processes must first of all be comprehended. Both the mapping and its comprehension are always bound up with social, historical, cultural, technological, linguistic, political, philosophical and individual commitments.

The mapping is based on pre-linguistic image schemata referring to motion, change, space, time, intellect, emotion and many other essential constituents of human existence and experience. For example, the typical science fictional conceptual metaphor Change is motion may be said to have generated from the progress image schema. This metaphor belongs to the most widespread type of conceptual metaphor, the event structure metaphor which moves from the source domain of space to the target domain of events. The event structure metaphor is not culturally restricted, i.e. it is universal in almost all languages (for more comprehensive description of types of traditional and conceptual metaphor and image schemata see McArthur (1992), Lakoff and Johnson (1988), Saeed (1997)). The progress image schema in its turn has developed from the physical or mental experience of functioning/acting/moving. Human experience usually envisages change as forward movement, progress, advancement, evolution, growth as in the following conceptual metaphors:

- Change is forward motion;
- Scientific/technological change is progress;
- Progress is forward motion;
- Progress is advancement.

However, the reverse direction, i.e. a backward movement, retrogression, devolution, fall, setback is also considered to be a change. And this negative change is especially relevant in science fiction dystopias in which

- Scientific/technological change is destruction;
- Scientific/technological progress is emotional regress.

Change as a central notion functions universally in science fiction and in John Campbell’s words quoted by B. Fowler (2001): “Science fiction unlike other literature assumes that change is the natural order of things.” In science fiction the image and conceptual metaphor are not only interdependent but also have a universal public orientation, i.e. they are closely connected with universal socio-cultural and technological concepts. They are in harmony with the social and historical setting and with the beliefs and personal constructs of the society or a micro-society. Moreover, conditioned by the social functional orientation of the genre, the metaphors used in science fiction, as mentioned above, are largely motivated by the science fictional conceptual metaphor Change is motion/movement. This metaphor is applied to human evolution, to scientific/technological development, and to “deculturation”, which first and foremost envisages adaptation and change, and to its variations (which display different degrees of metaphoricity in different contexts). Among such variations I recall:

- Action is motion, Action is self-propelled movement, Change is motion in time, Time is motion/change, Time is the process of change, Transformation is motion, Change is transformation, Change of thought is change of direction, Emotion is motion/power, Faith/purpose is a driving force, Evolution is progress, Evolution is blind, Harm is regression, Change of state is motion, Change is motion in location, Emotional/psychological change is self-propelled motion, Self-initiated change is an aim, Change is a journey, Negative effect prevents forward motion, Future is motion, Progress cannot be held back, Nature is self-moving, etc.

Other metaphors referring to different concepts of cognition are reflected in certain parts of science fictional contexts. See, for example:

- War is destruction, Revolution is evolution, Death is an end/termination, Immortality is a burden, Immortality is a dream, The present is the past becoming future, Time is duration, Good and evil are inseparable, Man’s choice of good over evil is seldom awarded/its always awarded, There is a purpose in the development of intelligence, Intelligence is accidental, Man is not Creator, Creating is divine, Intelligence cannot survive without sufficient purpose, Abilities are located inside a person, Beliefs are beings, Causes and effects are one unit, Competition is good/bad, Existence is a living form, Society is an existing form, Morality is strength, Theories are linked with people, Theories are not facts, Words are power, etc.

It is my own science fiction reading and studying experience that resulted in these generalized conceptual metaphors, hence some of them may sound somehow subjective (other examples referring to different concepts
of human cognition but also typical of science fiction, can be found in the Conceptual Metaphor Homepage (1994)).

Even if in most instances the conceptual metaphors I have mentioned, and many others, are not verbally presented in the context, they are mirrored in the minds of both the writer and the reader, helping the former to shape his/her creation and the latter to comprehend it.

The fact that the same metaphor, based on human emotion, intuition and universal value system, is used in different languages, demonstrates the correspondence of mapping between conceptual domains and neural mapping between the rational and the emotional in the human brain, i.e. the human conceptual system itself is metaphorically structured, and metaphor as a linguistic expression belongs to both conceptual and emotional domains. It is on this background of the conceptual-emotional combination that the stylistic surface, shaped as an image metaphor, appears in the context. In other words, first the metaphor pervades the thought (conceptual metaphor), then it starts dictating and forming style (image metaphor).

Thus, metaphorical thought + metaphorical imagination is a good combination to present metaphoric blending in science fiction discourse. Research has shown that the brief, formulaic utterances of conceptual metaphor demonstrate immense generative power in science fiction going far beyond concepts, extending into a large variety of complex image metaphoric associations on any idea or activity expressible in language and aiming at revealing new aspects of life through creative means, sometimes even through semantic and grammatical anomalies, dissimilarities and deviations. In such metaphors, the objects compared may belong to so completely different areas that sometimes it seems impossible for the reader to find a common basis between them or evaluate the metaphor without reading between the lines. Even if the metaphor is not too extended, a certain amount of background knowledge, intelligence, intuition and vision is needed to discern the underlying concept and comprehend the creative images, simultaneously appreciating their aesthetic value.

As the background concepts underlying science fiction are numerous, let us focus only on two variations of the general Change is motion conceptual metaphor, namely the Scientific/technological change is destruction and Scientific/technological change is progress and, respectively, on the image metaphors built on these concepts.

According to science fiction writer Ben Bova, “with fire humankind’s technology was born” to protect and keep civilization going but then “it led to the development of a technology that is now itself a threat to our survival on this planet” (1978, p. 21). The conceptual metaphor Scientific/technological change is destruction or Technology is a threat to our survival characterise science fiction metaphor for the following discourse contexts:

(1) No human being should have been alive in the nightmare world of flame and deadly gas and electronic destruction. The earth had been rolled and heaved again and again, soaked by the poison rain, turned into a moonscape of despair under the rumbling, lightning-pierced sky (“Ad Astra”, Harryson, 1977, p. 107).

(2) The lancet hurtled down out of the sky like a river of light. It struck the cube with a force that dwarfed the sum total of an annihilation visited on the cube all that day. The sound rolled across the plain and the light was blinding. Explosions came so close together, they merged into one endless report, the roof of the cube bathed in withering brilliance that rumbled the sun (“Sleeping Dogs”, Ellison, 1977, p. 49).

(3) It glided down hills like a ghost and slithered among rocks like a reptile. It leaped chasms, dodged falling stones, was singed once by lightning. It was a blob of protoplasm on a stick; it was a scarred hulk, and there was no real reason why it should be living and moving about (“Jack of Shadow”, Zelazny, 1971, p. 135).

(4) The gleaming metallic towers that surrounded him and continued onwards in never-ending multiplicity to beyond the horizon oppressed him; the whole busy, unheedling life of a world-metropolis cast him into the horrible gloom of isolation and pygmish unimportance. [...] In the four months since the shattering fall of the Foundation, Haven’s communication had fallen apart like a spider web under the razor’s edge. And in other respects, the siege was even closer; for the shrouds of helplessness and doom had already invaded (“Foundation and Empire”; Asimov, 1970, p. 74, 135).

(5) Gigantic. The words immense, monstrous, grotesque, massive, swollen, overpowering, beyond description. There on a mound rising above us, a bird of winds heaved with its own irregular breathing, its snake neck arching up into the gloom beneath the North Pole, supporting a head as large as a Tudor mansion; a beak that opened as slowly as the jaws of the most monstrous crocodile ever conceived, sensuously; ridges of tufted flesh puckered about two evil eyes, as cold as the view down into a glacial crevasse, ice blue and somehow moving liquidly; it heaved once more, and lifted its great sweat-coloured wings in a movement that was certainly a shrug (“I Have no Mouth, and I Must Scream”, Ellison, 1973, p. 173).

The destruction instruments and scenes described above belong to alternative worlds constructed by writers. Their investigation reveals complex syntactic and stylistic patterns of extended metaphoric usages reflecting with rhetorical force the desolation, devastation, pain and depression of the humans who have created the new tools of destruction themselves. The instruments ravaging the human land are armoured juggernauts self-controlled by an electronic guidance system (1), interstellar lancets (2), a provoked earthquake (3), mighty atomic and psychological weapons for galactic battle (4), the grotesque electronic being called hurricane bird created by a World War III sentient aggressive computer to torture the remnants of humanity (5).

The concept of destruction is extended to cover all the five contexts. Starting with the first utterances, it continues implicitly or explicitly into other metaphors that apply to it. In the first passage the destruction concept blends into the active metaphors.
nightmare world of flame and deadly gas and electronic destruction, the earth soaked by the poison rain, turned into a moonscape of despair, the rumbling, lightning-pierced sky.

Active metaphors are immediately perceived as metaphors as they are usually genuine and impressive. The epithets evil eyes and ice blue can be considered simple metaphors in the sense that there is only one point of resemblance between the two notions presented in each combination. They may as well be regarded as similar metaphors in which, based on the experience of the author and the addressee, the similarity between objects compared is easily perceptible.

In passage two the destruction concept is extended to include a simile to describe a new violent weapon, lancet, which hurtled down out of the sky like a river of light, and an extended metaphor (the rest of the passage) again referring to the concept of war and destruction (a force that dwarfed the sum total of an annihilation, explosions merged into one endless report, the roof of the cube bathed in withering brilliance that rivalled the sun).

The next passage (3) describes a “man-made” earthquake, a scarred hulk, a blob of protoplasm on a stick that glided down hills like a ghost, slithered among rocks like a reptile and like a living being leaped chasms and dodged falling stones.

The first sentence of the following passage (4) is a compound metaphor, containing various metaphorical elements that suggest additional items of meaning connected with the description of a world-metropolis and the thoughts and emotions of the lone hero Randu oppressed by the towers that surrounded him and continued onwards in never-ending multiplicity to beyond the horizon, by the unheeding life of a world-metropolis that cast him into the horrible gloom of isolation and pygmyish unimportance.

The next utterance (an extended metaphor including a clichéd metaphor, a simile, an active metaphor) reveals that the cause of his depression is the shattering fall of the Foundation (a stronghold of galaxy), part of which is his petty kingdom Haven where the communication had fallen apart like a spider web under the razor’s edge and war was close as the shrouds of helplessness and doom had already invaded.

Passage five from Harlan Ellison’s story starts with a grammatically deviated, stream of consciousness manner enumeration of words climatically ending on beyond description. In fact this is an implied/unstated metaphor that describes the outrageously evil creature through the adjectives gigantic, immense, monstrous, grotesque, massive, swollen, overpowering. The ninety-eight word sentence that follows is an extended metaphor, the central theme of which is the description of the evil bird, presented in a succession of other metaphorical utterances within this same structure:

- a bird of winds (an active metaphor), its snake neck arching up into the gnom (an active metaphor), a head as large as a Tudor mansion (a metonymic simile), a beak that opened as slowly as the jaws of the most monstrous crocodile ever conceived (a metonymic simile), as cold as the view down into a glacial crevasse (a metaphorical simile), lifted its great sweat-coloured wings in a movement that was certainly a shrug (a compound metaphor).

It should also be noted that the Scientific/technological change is destruction concept refers not only to physical but also to emotional/psychological destruction – Scientific/technological progress is emotional regress. The latter concept is most vividly expressed in the dissimilar metaphor of the title in H. Ellison’s story I Have no Mouth, and I Must Scream based on semantic anomaly. At first sight it seems impossible to find a common basis between the notions of having no mouth and screaming, but the larger context and inner vision/insight help the reader to evaluate the metaphor and interpret the emotions of the hopeless hero. The sentient computer has turned people into psychologically deteriorated creatures, the hero, though healthy mentally and morally, is physically a round being that could never have been known as human, a thing whose shape is so alien a travesty that humanity becomes more obscene for the vague resemblance (p. 177).

This inwardly alone “mouthless” rational being understands that the killer machine “who” destroyed the world and its inhabitants was created by humans because our time was badly spent and we must have known unconsciously that he could do it better (p. 177). The last homo sapiens’ silent scream of pain is a call to mankind, “Stop, before it is too late.”

I Have no Mouth, and I Must Scream can also be considered a literalized metaphor which exemplifies what I believe to be a significant stylistic marker for SF. As Ursula K. LeGuin notes,

“Literalization of metaphor is a characteristic of science fiction. In teaching the craft to people new to it, I use Delany’s phrase ‘subjunctive tension’ to alert them to a challenge not present in realistic fiction: the way in which the open context of science fiction brings the language alive” (LeGuin, 1993, p. 30).

Making clear as to what literality of metaphor is, I will bring an example from Paul Di Filippo’s “Stone Lives” (1986, p. 194):

Following the current craze, she has had a subdermal pattern of microchannels implanted. The channels are filled with synthetic luciferase, the biochemical responsible for the glow of fireflies, which she can trigger now at will. In the afterglow of lovemaking, she has set herself alight.

The metaphor she has set herself alight in a context of realistic fiction would be associated with passion but in the above piece of SF, in addition to symbolizing love, it has been literalized, i.e. the heroine has actually turned on the luciferase matter filling her subdermal microchannels to make her body luminous.

As any science fiction creation, the worlds explored within this study are not (or seem not to be) beyond the bounds of scientific reason or cognitive logic and can be considered empirical because they are compatible with a scientifically plausible empirical world, a world where scientific investigation is possible and fruitful” (Fowler, 2001).
Like in all science fiction, in the examples below the authors have used metaphor; this time to examine changes and motions which lead not to destruction but to the realization of the humanistic and optimistic aim of the genre. It is here that the conceptual metaphor

**Scientific/technological change is progress and its variations**

- Progress is advancement. Self-initiated change is an aim, Emotion is motion/power. Faith/purpose is a driving force, Emotional/psychological change is self-propelled motion, Purpose is a driving force, etc.

...work to illustrate the very real human need to create through emotional growth and advanced technology an increasingly beautiful world, a future secure from perpetrators of violence upon the earth and its inhabitants, global disaster and disharmony in social relationships.

The concept of technological advancement and fascinating imagination (conceptual metaphor + creative metaphor) underlie the metaphoric blends given below:

1. **Gave her back the small part of the dream that was hers. Tail flying, hooves digging dirt, magnificent body moving effortlessly over the rolling hills and grass, the horse became brother to the wind as he and his rider thundered off toward the waiting mountains. The poetry, you see, was when he moved (“Dream Gone Green”, Foster, 1977, p. 93).**

2. **Then he turned and looked out over the devastated land. He saw how the slanting rays of the sun brought color to the wilderness he had wrought. The winds had subsided somewhat, and it was as if there were a singing in the air. For all the wreckage and smoldering, there was a blasted beauty to the place. When the world is purged by winds and fires and waters, and the evil things are destroyed or washed away, it is only fitting that the last and greatest of them all be not omitted (“Jack of Shadows”, Zelazny, 1971, p. 142).**

The punned title (“Dream Gone Green”) is an extended metaphor (later reading may prove it to be a literalized metaphor as well) for the whole of A. D. Foster’s story. The given passage, which is a compound metaphor, cannot be perceived unless we read the story to learn that the dream belongs to a woman and an intelligent horse living on one of the many planets of the galaxy but still carrying in their veins the memory of the “Old Earth” which, because of people who controlled the power of science and technology, had turned into a desolate planet with toxic air and water. However, it was the same technological progress (in chemistry and bioengineering) that enabled the heroes to take the next evolutionary step: clear the water, cleanse the atmosphere, reintroduce flora and fauna and move there to realize their poetic dream of riding over the green land towards the mountains.

In the second passage the compound metaphor works to illustrate the concept of survival lying in crushing the evil machine to recreate the world through a necessity for belief in constructive science and human goodwill. The elimination of the machine caused winds and fires and waters raze cities and villages to the ground. Fortunately the slanting rays of the sun, colour, a singing in the air and a blasted beauty to the place testify that the evil things are destroyed or washed away, that the battle for survival has been won (the last and greatest of them all be not omitted).

**Conclusions**

That “SF is a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition” (Suvin, 1974), that “Sci Fi is distinguished by the narrative dominance or hegemony of a fictional novum validated by cognitive logic” (Suvin, 1974), that “what distinguishes SF from other genres is the fact that its estrangements are cognitive – scientifically possible or believed to be scientifically possible” (Fowler, 2001) is unarguable. The study indicates that the mentioned interaction of imagination and thought is typical of not only science fiction in general but its metaphorical representations in particular. The latter aspect, in its turn, is central to the understanding of how language/style/rhetoric on the one hand, and cognition/conceptual thought on the other, function in this unique genre.

What can thus count as a key peculiarity for science fiction is the inseparable relation of reason and emotion that allows it to transcend the dichotomy between the literal and the metaphorical and form fantastic “metaphoric blends” of genuine metaphors. “Metaphoric blending” is the term used by me to define the interaction, integration and mixture of conceptual and image metaphors. It should not be confused with Gilles Fauconnier and Mark Turner’s conceptual blending which “does provide a rich terminology for describing the creative products of others, but has little to say on the inspiration that serves as the starting point for each blend” (Conceptual Blending, 2012).

My approach tends to strengthen arguments that deny the split between emotion/imagination vs. cognition and focus on the inescapable interaction of conceptualization and metaphoricity. Moreover, I will try to conclude that **what underlies metaphoric blending in science fiction is concepts that are themselves inherently metaphorical and in their turn serve as a basis on which new, genuine image metaphors are built.** Hence, the present case study has enabled to focus on the typicality of interrelatedness of metaphor as a phenomenon of language and metaphor as a phenomenon of thought. The mentioned typicality suggests that in “scientific fiction” (Suvin, 1974) the conceptual metaphoric mapping, derived from mental experiences and implicitly or explicitly preserving the Aristotelian two-part model (A is B), extends and restructures, turning into a multiple, complex, fanciful, imaginative metaphoric blends. This integration of imagination and cognition may go beyond the literal ways of thinking to such an extent that very often the patterns of fascinating science fiction metaphoric blends can be explained only by the power of inspiration, imagination and fantasy, by the “emotive force and aesthetic dimension” (Kittay, 1987, p. 2) that creative metaphors possess.
References


Primary Sources of Data


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Metaforų suliejimas mokslo fantastikoje

Santrauka

Šiame straipsnyje nagrinėjama metafora, naudojama visų rūšių mokslo fantastikos diskurse. Jos tikslas – realizuoti dvi labai svarbias funkcijas: kylančias iš registro ontologinio dirbtinumo ir fikcijos generacinio ir fikcijos, siekiant įžvalgų metaforas, kai taip, kaip metaforinės minties ir metaforinio vaizdingumo konvergenciją. Siekiant šio tiksls buvo parinkta įvairių mokslo fantastikos šaltinių, o duomenims analizuoti taikytas atvejo tyrinio metodas. Tyrinio pordė, kad mokslo fantastika yra didžia dalimi motyvuojama konceptualiaja metafora (Change is motion/movement), kalbant apie žmogaus evoluciją ir mokslo, ir jos variacijomis (Change is forward movement, Scientific/technological progress is emotional regress i t.). Jos trumpiai kaip formulės pasakykime turi didelę generatyvų galą, siekiančią daug toliau nei sąvokos, išsiplečiančių i jį, sudėtingas kūrybos priemones. Todėl šis tyrinys yra atvejo tyrinio, suteiktas į metaforos, kaip kalbos reiškinio, ir metaforos, kaip minties reiškinio tarpusavio ryšiui. Pastaroji dichotomija yra ne tik svarbi ypatybė, kuri teikia naudingų žvalgybos metaforos tyrimams, bet ir išsidėstymas tarpusavio transformacijos kaip kognityvinės revolucijos dalį mūsų informacijos amžiui.

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