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Binary Opposition "Man-Machinery" in R. Bradbury Science Fiction Works: A Cognitive Linguistic Approach

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Abstract
This paper focuses on cognitive-linguistic features of the binary opposition "man-machinery" in the science fiction works by R. Bradbury. The article aims to determine the means of the verbal representation of "man-machinery" and build frame models of its components in Bradbury's science fiction writings. The study contributes to the stylistic and linguo-poetic analysis of binary oppositions in fiction texts, idiostylistics and genre theory. The study relies upon linguistic, stylistic, and discursive analyses as well as cognitive linguistic analysis to ensure the reliability and validity of the obtained results. Furthermore, four-stage algorithm methodology used in this research allowed the author to define a general literary context of the analyzed works, select the research material, analyze the identified means of binary opposition "man-machinery," and model frames of its components. The obtained results reveal that the linguistic embodiment of the components of the binary opposition "man-machinery" is based on the use of the lexical – direct and figurative, stylistic, and discursive means of nomination. The study reconstructs the concepts – the constituents of the megaconcepts MAN and MACHINERY and on the basis of anthropocentric perception compares their conceptual domains, namely as physical, psychological, mental, and social phenomena. The research reveals conceptual binary opposition MAN-MACHINERY as a tool for constructing a science fiction model of the world in Bradbury's texts within three parameters: space-time coordinates, cause and effect relationships, and valorative indicators. The introduced methodology of binary opposition analysis is perspective within the scope of science fiction, fiction texts and films.
Keywords: binary opposition, cause and effect relationships, conceptual binary opposition MAN-MACHINERY, frame modeling, science fiction model of the world, space-time coordinates, verbalization means of binary opposition components, valorative indicators

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Introduction

Binary opposition is presented as a universal principle of organizing the sign systems in the human world. Researchers from ancient philosophers to modern linguists have tried to comprehend the essence of binary perception, and, in particular, structuralists of the 20th century, specifically Trubetskoy (Trubetskoy, 1969), the founder of binary oppositions theory in phonology. Later, binary oppositions were researched in the fields of lexicology, stylistics, linguistic literary studies, cognitive linguistics.

Despite considerable advances in researching binary opposition as a characteristic feature of perceiving reality and thinking, there have been very few works that have provided studies on the binary opposition of science fiction texts in terms of cognitive linguistics and linguistic poetics. Therefore, this research aims to define verbal realization means of the binary opposition "man-machinery" by modelling frames of oppositional megaconcepts MAN and MACHINERY as a tool for building a science fiction model of the world in R. Bradbury's science fiction texts.

The following sections cover analysis and linguistic interpretation of the verbal representation means of the constituents of the binary opposition "man-machinery" in science fiction works by Bradbury as well as peculiarities of the conceptual binary opposition MAN-MACHINERY. Reconstruction of the concepts – the components of the megaconcepts MAN and MACHINERY enables deeper understanding of the writer's perception of man and machinery in his science fiction works. Building frame models of the MAN-MACHINERY components in Bradbury's works ensures its content characteristics. The research compares three parameters to investigate MAN-MACHINERY as a tool for constructing a science fiction model of the world in Bradbury's science fiction texts: space-time coordinates, cause and effect relationships, and valorative indicators.

Finally, the paper discusses the results of the linguistic cognitive research of the science fiction works by R. Bradbury and the interpretation of the obtained data. As a result, the study of the binary oppositions has obtained broader scope and perspectives, particularly in science fiction texts and in terms of cognitive linguistics as well as linguistic poetics.

Theoretical Background of the Research

Psychological and Philosophical Background of Binary Perception in the Human World

Considering the experience of scholars in the field of psychology, philosophy, and linguistics, binary opposition is represented as a universal principle of organizing the sign systems in the human world. Binary oppositions are embedded in human thinking evolutionarily and are conditioned by the peculiarity of signals transmission in the human brain causing stereotyping of the surrounding world within the framework of binary oppositions. The philosophical and logical background of binary thinking dates back to ancient scientists. Structuralists (Barthes, 1975; Baudrillard, 2000) introduced binary opposition as fundamental to human perception and culture. Philosophy and logic consider binary thinking to be connected with the binary perception of the surrounding world. Two objects can be determined by contrasting each other, which is typical for a scientific paradigm where phenomena are categorized basing on binary oppositions (Malinovich, 2011; Maslova, 2011; Ostrenko, 2014; Tetior, 2016).

Binary Opposition in Language Systems

The term "binary opposition" was first introduced to modern linguistics by Trubetskoy, (Trubetskoy, 1969) who developed binary opposition theory in phonology. He offered a system of binary oppositions of phonemes, which have characteristics like sense distinctive ability, a common basis for comparison, and balanced representativeness in the language phonetic system. Later, binary oppositions were studied in the field of lexicology: synonymy, antonymy (Denisova, 1996; Krapivnik, 2010; Willners, 2001), lexical and semantic groups, lexical and semantic fields (Akhmad&Chmel, 2015; Aliefirenko, 2013; Deese, 1965), stylistics: antithesis, oxymoron, metaphor, metonymy (Arnold, 2002; Fass, 1997; Johnson&Lakoff, 2003; Truszczynska, 2002/2003) linguistic literary studies: binarity as the basis of plot formation in the literary work, e.g. "life-death", "good-evil" (Odintsov, 2004; Khaitrudinova, 2012).

Conceptual Opposition as Main Principle of Reality Categorization

Cognitive linguistics paradigm uses the term oppositional concepts (Ponomariova, 2008; Romashenkova, 2012; Semegyn, 2012) determined as mental units that reflect the multivector axiological content of two opposite realities and are linguistically and culturally marked. According to a cognitive linguistic approach, the conceptual opposition model leads in interpreting social interaction and has universal grounding in different cultures. This is proved by regular systems of conceptual binary oppositions in different cultures (Antonova, 2016; Dubchak, 2011; Prykhodchenko, 2017; Sakharova, 2007). Binary oppositions are "*two-member units whose left component is positively marked and right component is negatively marked, which presupposes mandatory axiological meaning of the opposition"* (Sysoiev, 2010, p. 270).

Research Methods

The research is developed on the basis of linguistic poetics methods and cognitive linguistic analysis in the form of an algorithm consisting of four stages.

The first stage study reveals a general literary context in which the science fiction novels and short stories by Bradbury were created using linguistic poetics analysis. A genre analysis of the writer's science fiction texts highlighted their peculiarities. Bradbury's science fiction focuses not only on the technical advances but also the technical progress considered by the author as a component of consumer society with moral and psychological consequences being crucial for the writer. Therefore, Bradbury's texts are psychological texts based on science fiction full of symbolism and philosophy.

The second stage involved selecting the research material: a continuous sample of 2,187 means of nomination of the binary opposition "man-machinery", of which 1,117 units nominate man and 1,070 nominate machinery. Almost equal distribution of the nomination means proves that both man and machinery are equally important for the author in an attempt to reveal the interaction between them. Thus, such endeavors can be considered one of the main genre features of Bradbury's science fiction works.

The third stage of the study applied linguo-stylistic and discursive analysis of identified means of opposition "man-machinery". Results enabled a comparison of the components' content of this binary opposition in the Bradbury's science fiction writings.

Cognitive linguistic analysis and frame modelling of the MAN-MACHINERY components in fourth stage revealed them to be megaconcepts – the highest level of abstraction concepts that have hierarchical structure (Nikonova, 2008; Prykhodko, 2013) and provide detailed information of the above-mentioned conceptual binary opposition. The reconstructed information made it possible to characterize conceptual binary opposition MAN-MACHINERY as a constituent of Bradbury's world model represented within three parameters: space-time coordinates, cause and effect relationships, and valorative indicators.

Results

The research results revealed that the linguistic embodiment of the binary opposition "man-machinery" components in the writer's works is based on the use of lexical, lexical and stylistic, and discursive means of nomination. For each type of means, the subgroups are distinguished on the basis of functional and thematic parameters, the thematic groups are systematized, and the most essential characteristics of the man and machinery represented by such nomination means are identified. It was determined that the basis of nomination of the components of binary opposition "man-machinery" is lexical means of direct nomination (59.26%), while the share of means of figurative nomination is 29.08%, and discursive means constitute only 11.66%.

The lexical means of direct nomination (59.26%) used as a means of verbalizing the binary opposition "man-machinery" in Bradbury's science fiction works are intended to name objects of the fiction world, their actions, states and essential characteristics, and represented by means of direct substantive (20.94%), attributive (26.29%) and processual (12.03%) nomination. The means of direct substantive nomination are formed by concrete and abstract nouns, whereas the means of direct attributive nomination are formed by adjectives, present and past participles, adverbs and attributive groups with internal predication. Lastly, the means of direct processual nomination are verbs of denoting actions and states.

The associations that emerge in the writer's consciousness in relation to man and machinery are represented by the means of figurative nomination – tropes (29.08%), distributed according to the type of meaning transfer into the groups of metaphorical (28,72%) and metonymic (0,37%) means. The means of metaphorical group are represented by metaphor (e.g. *"I just sat in my car, smiling, feeling of that flannel with my ears. I felt drunk with Freedom!"* (Bradbury, 1953b, p. 3)– to demonstrate an emotional state of "man"), personification (e.g. *"His wife paused in the middle of the kitchen and watched the stove busy humming to itself, making supper for four*. (1950, p. 1) – to demonstrate action features of mechanical appliance able to act like man), epithet (e.g. *great python* – to nominate fire hose), and simile (e.g. *"The Nose [of the City] sifted and worried this air, like a connoisseur busy with an ancient vintage."* (1951, p. 157) – to demonstrate mechanical city ability to act like man), while the metonymic group is presented by metonymy and synecdoche. Metonymy is used to reveal the qualitative features of the component "machinery" of the binary opposition "man-machinery" and emotional state of the component "man" of the binary opposition "man-machinery": *"He felt his body divide itself into a hotness and a coldness, a softness and a hardness, a trembling and a not trembling, the two halves grinding one upon the other*." (1953a, p. 10). Synecdoche can be exemplified by interpretation of the walls of the house as the absent interlocutor by one of Bradbury's main characters, symbolizing his loneliness, that

is his emotional state: *"Of course I'm happy. What does she think? I'm not? he asked the quiet rooms."* (1953a, p. 4).

A tool of demonstrating how man and machinery "fit" into the fiction reality created by the author is the means of discursive nomination of "man-machinery" (11.66%) that do not have a clear syntactic structure. The following example of "machinery" demonstrates its signs of emotional state (3.92% of the identified units). As Bradbury created it to replace people in science fiction texts, it acquires certain features of a person: *"Braling Two gestured irritably. "And when you come back from having a good time, back in the box I go."* (Bradbury, 1951, p. 153). In this abstract, a marionette is created to replace a man, which shows sadness because it is a substitute and cannot exist independently. Describing the situation that the marionette is hidden whenever the original person is present, the author accentuates that even created to imitate man, machinery cannot experience and demonstrate the emotions of a person.

Analysis, systematization, and comparison of components' different levels of "man-machinery" verbalization in Bradbury's science fiction works distinguished the common and distinctive features in the nomenclature and thematic groups of these means, leading to the following conclusions: man is presented through the inner world, while machinery, whose purpose and actions perform for or in relation to humans, is presented through external signs and its communication with other characters.. Both man and machinery are described through the prism of their perception by a man; therefore, the "man-machinery" features are anthropocentric.

Bradbury's inventory of thematic groups of "man-machinery" made it possible to reconstruct the concepts – the constituents of megaconcepts MAN and MACHINERY. These megaconcepts are structured in the form of frames composed of concepts-slots, grouped into parceles that form conceptual domains. The basis for comparing the conceptual domains of the megaconcepts MAN and MACHINERY and their components is anthropocentric perception of man and machinery in the writer's works.

The following conceptual domains were compared: 1) "man as a physical phenomenon" (28.11%) and "machinery as a physical phenomenon" (76.82%); 2) "man as a psychological phenomenon" (44.13%) and "machinery as a psychological phenomenon" (7.66%); 3) "man as a mental phenomenon" (21.66%) and "machinery as a mental phenomenon" (1.68%); 4) "man as a social phenomenon" (8.51%) and "machinery as a social phenomenon" (13.83%). Comparing these conceptual domains was performed both on the basis of common and distinctive features in the nomenclature of parceles and concepts-slots within the conceptual domain as well as on the sense content of its constituents.

An analysis of Bradbury's MAN-MACHINERY as a component of the science fiction model determined that machinery has a wider range of possible actions and is more active than man, while man is superior to machinery regarding the ability to interact psychologically or emotionally with the world, the broader range of mental qualities of a man compared to machinery, and the ability to become a full member of society that is inaccessible for machinery. MAN-MACHINERY is considered a tool for constructing a science fiction model of the world in Bradbury's science fiction texts. There are three parameters of the science fiction model of the world to be compared: space-

time coordinates (physical parameters, movement in space, physical interaction with the outside world, mutual influence of human and technology, and the ability to change in time), cause and effect relationships (socialization and perceiving the world) and valorative indicators (ethical evaluation, aesthetic evaluation, aesthetic and ethical evaluation and utilitarian evaluation).

It is revealed that, within the space-time coordinates, the most important aspect is the dynamics that is manifested as an emotional one for the man and as the physical one for machinery:

Table 1. *Organization of space-time coordinates of the conceptual binary opposition MAN-MACHINERY*

Space-time coordinates	**Parameters of an opposition concept MAN**	**Parameters of an opposition concept MACHINERY**
Physical parameters	– naturality – originality	– mechanisms and their components – imitation of man
Movement in space	– slowness – use of the own body resources – restrictions	– speed, smoothness – use of the technical devices created by man – great dynamics
Physical interaction with the outside world	– slight activity – inner world direction dominated over outside world direction – sound perception	– significant activity – outside world direction dominated over inner world direction – sound production
Mutual influence of human and technology	– almost does not affect machinery	– negative effect on man
Ability to change in time	– wide range and significant dynamics of psychological and emotional state – able to change in time under certain circumstances	– restricted psychological and emotional state – unable to change in time

Within the framework of cause and effect relations, a person is characterized by a high level of socialization and an empirical way of perceiving the world; in contrast, machinery is characterized by the inability to socialize and analytically perceive the world:

Table 2. *Organization of cause and effect relations of the conceptual binary opposition MAN-MACHINERY*

Cause and effect relations (processes schemes)	**Parameters of an opposition concept MAN**	**Parameters of an opposition concept MACHINERY**
Socialization	– social hierarchy	– no social hierarchy

	– ability to socialize – change of social roles – productive communication	– inability to socialize – stable social roles – non-productive communication
World perception	– sensitive perception – naïve reality perception	– analytical perception – research algorithms application

Within the framework of valorative indicators, a person can receive both a positive and a negative evaluation. In contrast, machinery is usually perceived negatively since the person is considered as an individual creature, endowed with a wide range of possibilities and states, and overuse of technology destroys one's personality and makes technology harmful for society:

Table 3. *Organization of valorative indicators of the conceptual binary opposition MAN-MACHINERY*

Valorative indicators	**Parameters of an opposition concept MAN**	**Parameters of an opposition concept MACHINERY**
Ethical evaluation	– can be positive and negative – positive evaluation of a person who restricts use of technology and is able to understand the surrounding world – negative evaluation of a person who over-relies on technology does not pay attention to living being and nature around	– mostly negative – negative evaluation is connected with the person's fear of machinery power and inability of machinery to have the emotions of a person
Aesthetic evaluation	– can be beautiful and ugly as man is created by nature, its appearance is genetic and cannot be controlled by man	– in most cases – beautiful as it is created by a person who is able to create any appearance of machinery
Aesthetic-ethical evaluation	– light colours and diminutive forms represent positive evaluation	– light colours represent positive evaluation
Utilitarian evaluation	– usefulness of a person for other people is not considered	– created by man, the main purpose of machinery is to be useful to people – as machinery is automatized its features can be evaluated both positively and negatively

Conclusion

Science fiction works by Bradbury oppose man and machinery forming different vector phenomena despite having a common basis. "Man" receives more positive evaluation and dominant position over "machinery". The linguistic interpretation of the components of "man-machinery" proves that they are actualized in the science fiction by Bradbury at lexical, stylistic and discursive levels. This paper reveals the conceptual binary opposition MAN-MACHINERY as a

tool for constructing a science fiction model of the world in Bradbury's science fiction texts within three parameters: space-time coordinates, cause and effect relationships, and valorative indicators.

The suggested methodology has potential application in discourse studies, sociolinguistics, and psycholinguistics. The obtained results contribute to linguo-stylistic studies of binary oppositions in fiction texts and enrich the system of knowledge of idiostyles. Frame modelling and comparative analysis of the structure and content of the constituents of the conceptual binary opposition MAN-MACHINERY strengthens the positions of cognitive linguistics in the sphere of semantics analysis as well as contributes to genre theory and linguistic poetics.

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