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## ОТ ФИТОМОРФИЗМА К МЕТАФОРИЧЕСКОЙ ТЕРМИНОЛОГИЗАЦИИ В МЕДИЦИНЕ

**Танева Светлана Йорданова**

Доктор филологии, главный ассистент, Факультет общественного здоровья. Медицинский университет. София, Болгария. ORCID: <https://orcid.org/0000-0002-1348-0029>. E-mail: [svetlanataneva@abv.bg](mailto:svetlanataneva@abv.bg)

## FROM PHYTOMORPHISM THROUGH METAPHORICAL TERMINOLOGIZATION IN MEDICINE

**Taneva Svetlana Yordanova**

PhD, chief assistant, Faculty of Public Health. Medical University. Sofia, Bulgaria.  
ORCID: <https://orcid.org/0000-0002-1348-0029>. E-mail: [svetlanataneva@abv.bg](mailto:svetlanataneva@abv.bg)

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**Аннотация. Цели работы:** сформулировать исследование в теоретическом отношении - Теория Концептуального Бленда Фоконье и Тернера; идентифицировать и выделить английские фитоморфные метафоры из медицинского дискурса; изучить концептуальное измерение и описать концептуальные компоненты каждой фитоморфной медицинской метафоры; проследить концептуальный переход на основе корреляций компонентов исходного домена и целевого домена при мепинге и динамику значений в генерическом пространстве до создания новой метафорически нагруженной структуры в бленде; проиллюстрировать общую динамику процессов, ведущих к бленде; повысить терминологическую метафорическую осознание и лингвистическую медицинскую компетентность студентов-медиков и специалистов.

**Материалы и методы исследования.** Материалом для исследования послужили восемьдесят четыре (84) однословных и сложных английских фитоморфных метафорических термина из домена медицины. Применены методы семантического словарного анализа, анализа дефиниций, концептуальной интеграции (когнитивного анализа), компонентного анализа, статистический метод.

**Обсуждение и результаты исследования.** Изложена сущность ментального пространства, основные идеи, заложенные в Теории Концептуального, Бленда Фоконье и Тернера - интеграционные процессы с обменом информацией, терминологизацией и

возникновением результирующей структуры с новым смыслом. Отмечена значимость фитоморфных метафор для лучшего понимания анатомических объектов, симптомов и синдромов, заболеваний. Прослежены этапы формирования трех примерных фитоморфных метафор (Волосая луковица, Болезнь „кленового сиропа“/лейциноз, Клубничный язык): ассоциативные корреляции, мепинг и совместное обмен общего объема информации, бленд, концептуализация и формирование новой терминологической единицы.

**Выводы.** Сделаны следующие выводы: 1. Мепинг лексики объектов реального мира и медицинских терминов во входных ментальных пространствах (пространство источник-вход 1, пространство цель-вход 2). 2. Объединение общего концептуального измерения двух входных пространств в генерическое ментальное пространство с мотивационными признаками: форма, положение, функция, поверхность, консистенция, запах, цвет. 3. Терминологизация составной лексики в процессе концептуального бленда и образование новой метафорической единицы различного концептуального измерения. 4. Анатомические объекты, симптомы, синдромы и заболевания оказались наиболее частыми номинациями фитоморфных метафор. 5. Уровни обработки информации для всего корпуса английских фитоморфных метафор, экцерпированных из медицинского дискурса и исследованных (84), следуют алгоритму четырехфреймовой модели Фоконье и Тернера.

**Ключевые слова:** английский фитоморфный метафорический термин, ментальное пространство, мепинг, бленд, медицинский дискурс.

**Annotation. Objectives:** to frame the study in theoretical terms - Fauconnier and Turner's Theory of Conceptual Blending; to identify and excerpt English phytomorphic metaphors from medical discourse; to study the conceptual dimension and outline the concept constituents of each phytomorphic medical metaphor; to follow up the conceptual transition based on the constituents' correlations of source domain and target domain in mapping and dynamics of meanings in generic space until generating a new metaphorically loaded structure in blending; to present overall dynamics of processes leading to blending in figures; to raise the terminological metaphorical awareness and linguistic medical competence of medical students and professionals.

**Materials and research methods.** Eighty-four (84) one-word and compound English phytomorphic metaphorical terms units from medical domain served as material for the study. Methods of semantic dictionary analysis, definition analysis, conceptual integration (cognitive analysis), component analysis, statistical method have been applied.

**Discussion and results of the study.** The essence of the mental space is outlined, the key ideas laid down in Fauconnier and Turner's Theory of Conceptual Blending - integration processes with information exchange, terminologicalization and emergence of a resulting structure with a new meaning. The significance of phytomorphic metaphors for a better understanding of anatomical objects, symptoms and syndromes, diseases has been pointed out. The stages of formation of three exemplary phytomorphic metaphors (Hair bulb, Maple syrup urine disease, Strawberry tongue) have been followed up: associative correlations, mapping and sharing common information volume, blending, conceptualization and generating a new terminological unit.

**Conclusions.** The following conclusions have been drawn: 1. Mapping of real-world objects lexis and medical terms in input mental spaces (source-input space 1, target-input space. 2. Unifying the common conceptual dimension of the two input spaces in the generic mental space with motivational features: shape, place, function, surface, consistency, smell, colour. 3. Terminologicalization of constituent lexemes in conceptual blending and generating of a new metaphorical unit with a difference in conceptual dimension. 4. Anatomical objects, symptoms, syndromes and diseases prove to be the most frequent nominations expressed by means of phytomorphic metaphors. 5. The levels of information processing for the entire corpus of English

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phytomorphic metaphors excepted from the medical discourse and studied (84) follow the algorithm of Fauconnier and Turner's four-frame model.

**Key words:** English phytomorphic metaphorical term, mental space, mapping, blending, medical discourse.

**Introduction.** Defining the cognitive essence of human thinking rests on metaphor. Human reason and human ability to name images and objects from the surrounding world are part of the complex dynamic process called language. Right here, in this act of verbally identifying oneself and the world, the binary potential of the metaphor as a carrier of direct and figurative meaning is born. Two essences of metaphor, with which you can discover not only the primary archetypal manifestation but traverse the entire time range of human existence, as well. This explains the consolidated opinion of scientists from different scientific fields with regard to the metaphor as a "container" of philosophy, logic, hermeneutics, linguistics, psychology, psychoanalysis, literary studies, literary criticism, semiotics, rhetoric, fine arts theory (Arutyunova, 1990, 15, I. Bocharin, 2021, 112). Perception, language, thinking, memory, action are cognitive structures coordinated by metaphor. However, by means of metaphorization the meaning acquired through analogy by the verbal construct, not the literal one, reaches human consciousness. The transfer of meanings and their layering into a new figurative construct is a definitive finding that can be found in every scientific theory of metaphor from Aristotle to the present day. Modern linguistic theories place the metaphor in the depths of the human mind knowledge and examine it as a cognitive mechanism. Thus, a new scientific direction in linguistics - cognitology - was formed. This period is defined as a cognitive turn in linguistics and even as a cognitive revolution, since a mental operation and a way of knowing, categorizing, conceptualizing, evaluating and explaining the world is already being sought in the metaphor (Chudinov & Budaev, 2007, 2, Kolokoltsev, 2021, 1132).

In his scientific analyses, Earl McCormack defines metaphor as an evolutionary cognitive process, which is realized successively on three levels: culture, semantics and syntax, knowledge. He differentiates three processes - linguistic, semantic and syntactic, cognitive - relevant to the functioning of cognitive metaphor. He also introduces the concept of "basic metaphors", which are based on opposition or analogy. In his theory („A Cognitive Theory of Metaphor“) McCormack claims that cognitive metaphor is, however, a movement of consciousness guided by the processes of interaction between culture, language, knowledge, experience (McCormack, 1990, 380-381). In 1980 George Lakoff and Mark Johnson published their seminal scholarly work „Metaphors We Live By“ with an upgraded concept of metaphor (Lakoff & Johnson, 1980, Guryanov, 2023, 149). The Theory of Conceptual Metaphor they created is based on three affirmations:

1. Metaphor is a cognitive phenomenon, not a linguistic one;
2. The metaphor is a mapping between two domains - the source domain and the target domain. They are a reflection of experience and by means of them the new conceptual structure is built;
3. Linguistic semantics is based on experience.

A core concept in The Theory of Conceptual Metaphor is that metaphor is not just a stylistic figure, but thinking is inherently metaphorical. It is characterized by unidirectionality - from the source domain to the target domain. The reverse direction is not possible. The terms "target" and "source" were introduced by J. Lakoff and M. Johnson (Lakoff & Johnson, 1980) while the term "domain" was introduced by R. Langacker. He defines it as cognitive totality, mental experience, representational spaces, conceptual constructs or conceptual complexes (Langacker, 1987, 147). The source and target domains are equivalent with respect to the associations imposed by the metaphorical meaning. But in

the transition from the source to the target domain, the meanings function and form a cognitive mechanism based on the basic cultural knowledge of the individual. Therefore, the target domain is the experience, and the source decodes, identifies the target. A conceptual sphere from which expressions are extracted in order to make sense of and represent another conceptual sphere is a source. Lakoff, in turn, developed his system of mental organization involving idealized cognitive models, which are conventional and prototypical conceptual representations resulting from a mental exercise in which our minds construct concepts as abstract entities (Lakoff, 1993, I. Bocharin, 2021). These units are abstract generalizations about objects and phenomena in reality.

The multitude of studies and analyzes of cognitive metaphor over the years, the birth of a number of theories - the Theory of Conceptual Metaphor; the Theory of Experientialism (Lakoff and Johnson); the Theory of Primary and Complex Metaphors (Grady); the Theory of Conceptual Blending (Fauconnier and Turner); the Theory of Mental Spaces (Fauconnier); Descriptive Theory of Metaphors (Baranov, Karaulov); the Theory of Metaphorical Modelling (Chudinov), etc. prove the fact that metaphor continues to provoke modern researchers - linguists. Moreover, metaphor is an object of study in many scientific fields, including medicine, where diagnostic work, clinical practice, medical culture and medical education utilizes metaphorical exchange. The whole transition from auditoriums and laboratories to clinics and hospitals points out that medical language is inhabited by metaphors. Once stepped on the metaphorical territory medical students could easily get lost on the way of their apprenticeship. They do necessitate adequate guides, models and algorithms of teaching the metaphorical medical terminology, which will facilitate the acquisition of this specific lexical layer and become a reference point for them in their future training and work with patients.

**Purpose and objectives of the study.** Consequently, the following objectives are the focus of the current study:

1. To frame the study in theoretical terms by means of the basic postulates of the Theory of Conceptual Blending (Fauconnier and Turner);
2. To identify and excerpt English phytomorphic terminological metaphors from medical discourse.
3. To explore the conceptual dimension and outline the constituents of each concept structurally building the considered phytomorphic medical metaphor.
4. To follow up the construction of the conceptual transition based on the constituents' correlations of the two input spaces (source-input space 1, target-input space 2) by mapping/projecting.
5. To follow up the dynamics of the functioning of the meanings in the generic space with information common to both inputs until they are embedded in the blending space as a new resulting structure metaphorically loaded.
6. To create a visual framework model of each phytomorphic terminological metaphor from the considered English corpus in medical discourse.
7. Practical aspect – A. To apply the Theory of Conceptual Blending to facilitate the teaching of metaphorical terminology material in medical universities; B. To increase the terminological metaphorical awareness and linguistic medical competence of future and current medical professionals.

**Materials and Methods.** A corpus of eighty-four one-word and compound English phytomorphic metaphorical terminological units from the scientific field of medicine served as material for the study. The terms belong to the non-anthropogenic metaphorical model “Flora”. The phytomorphic metaphor study material was excerpted specialized literature: dictionaries, reference books, official documents, international classifications, medical reports, case studies, textbooks and periodical publications (Merriam - Webster’s medical dictionary, 2016; McGavock, Johnston & Lockett, 2007; Standring, 2020). The selection of the phytomorphic metaphorical terms took into

account: the scope of the representative sample (the terms considered are excerpted from all directions of medical discourse), knowledge and expertise level, frequency in the specialized literature, significance for the professional training, metaphoricality and non-anthropogenicity.

The study applies an appropriate baseline methodology adequately applicable to the study of metaphoricality in the medical domain: 1. Method of semantic dictionary analysis; 2. Method of definition analysis; 3. Method of conceptual integration (cognitive analysis); 5. Method of component analysis; 6. Statistical method.

**Discussion and results.** The main task of linguocultural science nowadays is the analysis of the world linguistic picture. A number of factors influence its formation: history, language, way of life, traditions, religion, fauna, flora, etc. It has been established that the plant vocabulary has a wide semantic volume and expressiveness, thanks to which it can be located in the domain of medicine, describing anatomical objects, symptoms, diseases. A visual image of the plant whose specific features are projected onto the human body structure as well as high productivity of the phytomorphic metaphors in the considered medical discourse drew our attention. The main plant parts and stages of development are reckoned as the source of phytomorphic metaphorical terms in medicine.

The corpus of phytomorphic metaphorical terms is studied from a nominative-cognitive perspective on the basis of Fauconnier and Turner's Theory of Conceptual Blending. Developing the Theory of Mental Spaces in the scientific works "Mental Spaces" and "Mappings in thought and language" Fauconnier, in collaboration with Turner, created the Theory of Conceptual Blending, which found a place in a number of publications and the book "The way we think" (Fauconnier, 1994; 2006; Fauconnier & Turner, 2003). Mental spaces are regions of conceptual space that contain a particular type of information. They are built on the basis of generalized pragmatic, cultural, linguistic strategies when selecting information. The principles of mental space formation and the relationships established between the spaces themselves have the potential to form an unlimited amount of meaning. According to Fauconnier and Turner, the mechanism through which the dynamics in the construction of meanings occurs is the creation of an integration network as a result of conceptual blending. The integration network consists of at least two input mental spaces - source-input space 1, target-input space 2, a generic space - a common cognitive space with common information about the two inputs and the integrated space or conceptual blending where a structure arises with a new meaning of the considered concept, different from the meanings of its structuring elements.

In following up the dynamics of the functioning of the meanings of the phytomorphic terminological metaphors from the representative sample of the corpus, it becomes clear that the mechanism by which these meanings are embedded in the new metaphorical structure is identical to that described in the Theory of Conceptual Blending. **Three of the phytomorphic metaphors** will serve as examples of the conducting processes in mental spaces - making associative links, making sense and extracting information, mapping/projecting, blending and generating. Their stages of formation will be followed up.

**Hair bulb/Космена луковица** is the enlargement of the inferior part of hair follicle underneath skin surface. It is round onion-shaped structure containing dermal papilla and hair matrix. Dermal papilla consists of mesenchymal cells accounting for hair growth regulation. Blood vessels and nerve endings in dermal papilla supply oxygen and nutrients to the hair root. Hair matrix consists of keratinocytes that move upwards to produce hair shaft. The stem cells inside the bulb and melanocytes determine hair colour.

While studying the information contained in both concepts Bulb and Hair bulb, a very high percentage of similarity was found between the two spaces - the source domain Flora and the target domain Anatomy. Hence the strong metaphorical imagery of the phytomorphic terminological metaphor "Hair bulb". The mapping process between the conceptual dimensions of both input spaces and (source and target) and a dynamic interpretation of the meaning units in them can be observed.

Extraction of the common for both concepts information in the generic space occurs. It covers the constituents referring to the nominative signs: function - feed, supply, nutrition, grow, build a stem/shaft, shape - round, widened, onion-shaped and place - inferior, base, underneath, root end. The bulb of the plant is rounded, as is the hairy bulb. Functionally, both bulbs are responsible for the plant/hair growth cycle, supplying the necessary nutrients. They are located deep in the soil/dermis respectively. Blending assimilates common lexemes, terminologizes them and builds up a new terminological unit with new medical connotation. Figure 1 depicts the associative relationships and interaction between mental spaces in the algorithm of the four-frame model of “Hair bulb” phytomorphic metaphor.

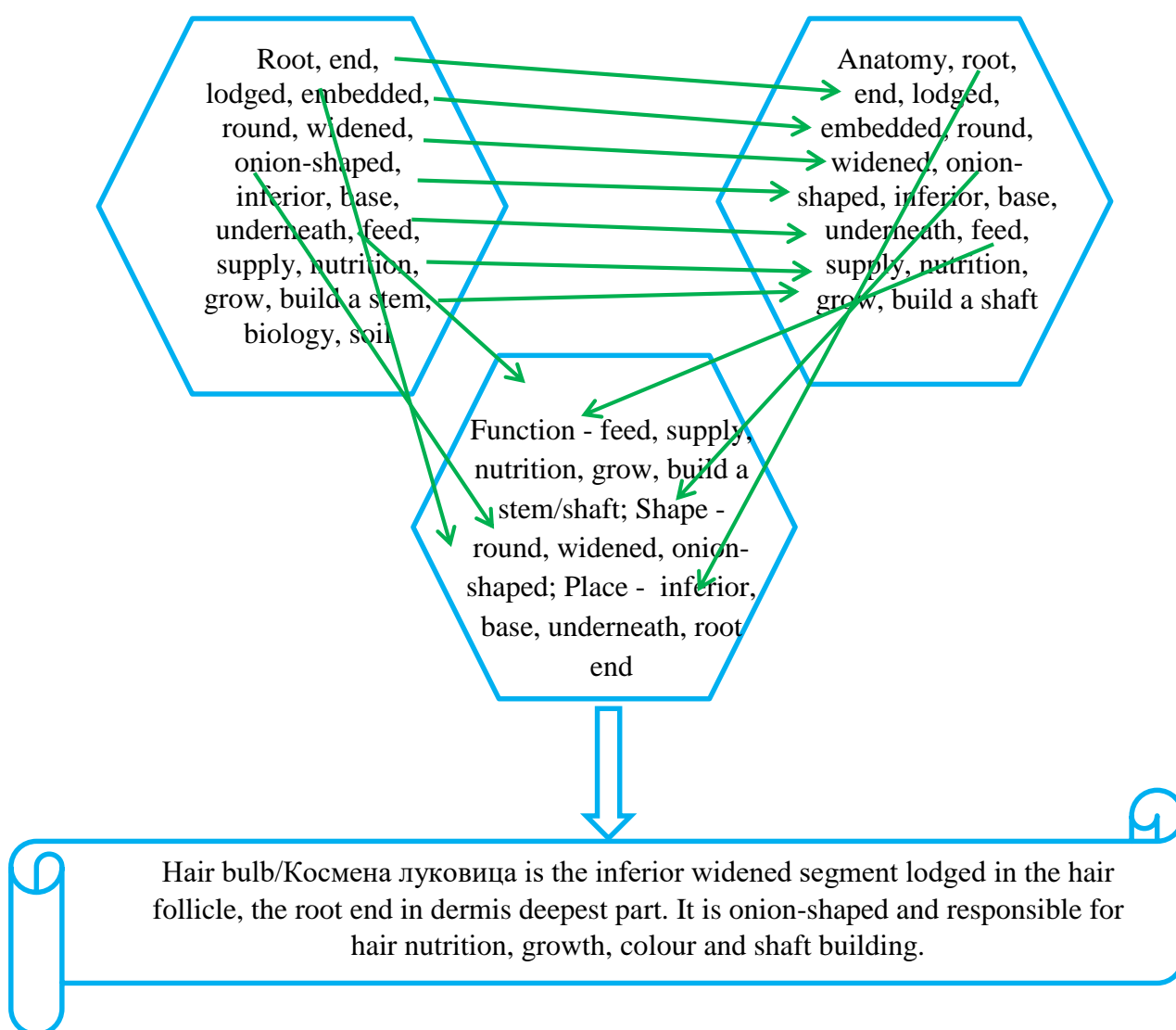


Fig. 1. Framework model of English phytomorphic metaphorical term “Hair bulb”

**Maple syrup urine disease (MSUD)/болест на „урина като кленовия сироп“** is due to an enzyme defect in amino acids (leucine, isoleucine and valine) catabolism. These amino acids could accumulate and with keto acids they can lead to complications – encephalopathy (degenerative cerebrum disease). MSUD is a very rare life-threatening metabolic disorder and affects newborns. It is inherited, as well in a case with both parents – carriers of the specific gene mutation and pass it on. The symptoms are as follows: sweet smell of urine, sweat or earwax; lethargy; irritability; poor

appetite; weight loss. The disease can progress to metabolic crisis with spasms, convulsions, vomiting and can lead to complications such as: neurological issues, attention deficit, depression, osteoporosis, pancreatitis, movement disorders, coma and even lethal end. A patient with MSUD needs a change in his diet limiting the three amino acids and providing essential nutrients. He needs to be monitored and receive emergency care for metabolic crises. Liver transplant has turned into a cure for MSUD since 2004.

While studying the phytomorphic metaphor “Maple syrup urine disease” (MSUD) several elements – carriers of common information for both input mental spaces have been detected after mapping. These common elements are provoked by our linguistic consciousness, which quite naturally associates the distinctive sweet smell of urine, a symptom of Maple syrup urine disease, with that of maple syrup, which is beneficial for the body due to its oxidant properties. Thus the generated mental space is created with the shared constituents classified in two nominative features: smell (distinctive, strong, sweet) and consistency (liquid, syrupy). Then the algorithm of Fauconnier and Turner's four-frame model proceeds with the inheritance of the identified common information in blending, on the basis of which the common constituents are terminologicalized to define a new terminological unit with its own semantic field.

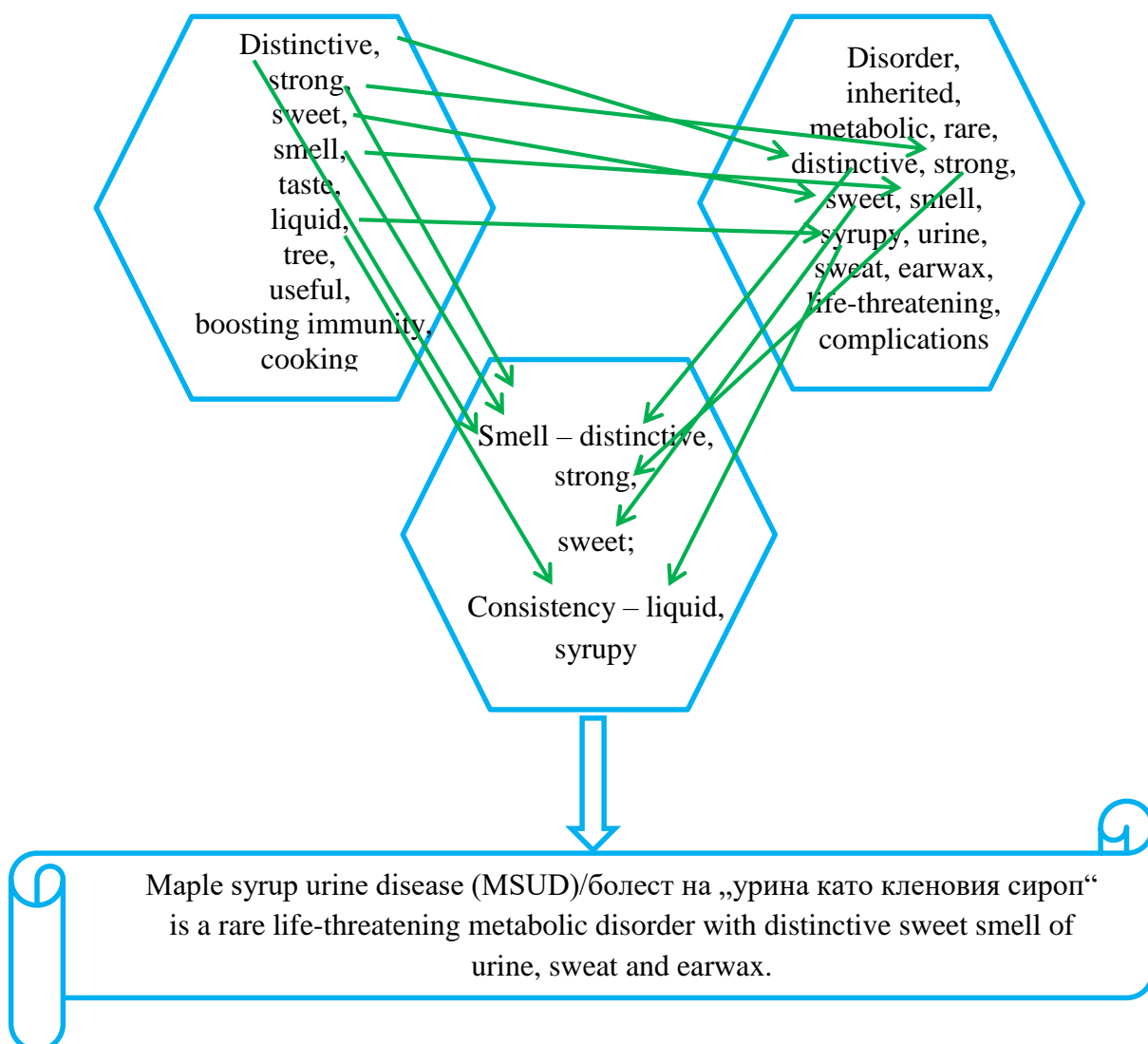


Fig. 2. Framework model of English phytomorphic metaphorical term “Maple syrup urine disease”

The metaphor under consideration Maple syrup urine disease is of interest because it is a model of a very strong change in the plant due to its culinary processing. Therefore, it can be taken outside the model Flora and placed in the model Gastronomy/Culinary. In this particular study, the metaphor discussed is accepted as phytomorphic on the grounds of source concept origin (maple syrup is made from the sap of trees - sugar maple, red maple, black maple, etc.). The information not absorbed by the blending relates to the narrower specificity of the maple syrup concept: influence and result (useful, boosting immunity). In figure 2 the links between the four mental spaces with the subsequent formation of the new term “Maple syrup urine disease” is explicated visually.

**Strawberry tongue/„Ягодов“ език** is a term that describes the tongue being red, bumpy and swollen resembling a strawberry or raspberry. It is considered to be a symptom that is a result of some disorder or condition. Such a symptom can be associated with scarlet fever, Kawasaki disease, vitamin deficiency (vitamin B-12, folic acid), allergies, toxic shock syndrome, glossitis. Treatment depends on the reason provoked strawberry tongue but commonly involves a course of antibiotics, antihistamines, intravenous immunoglobulin and aspirin in patients with Kawasaki disease. Toxic shock syndrome, particularly, is a life-threatening condition induced by the release of toxic and harmful substances due to a bacterial overgrowth of *Staphylococcus aureus* and should be treated as an emergency case.

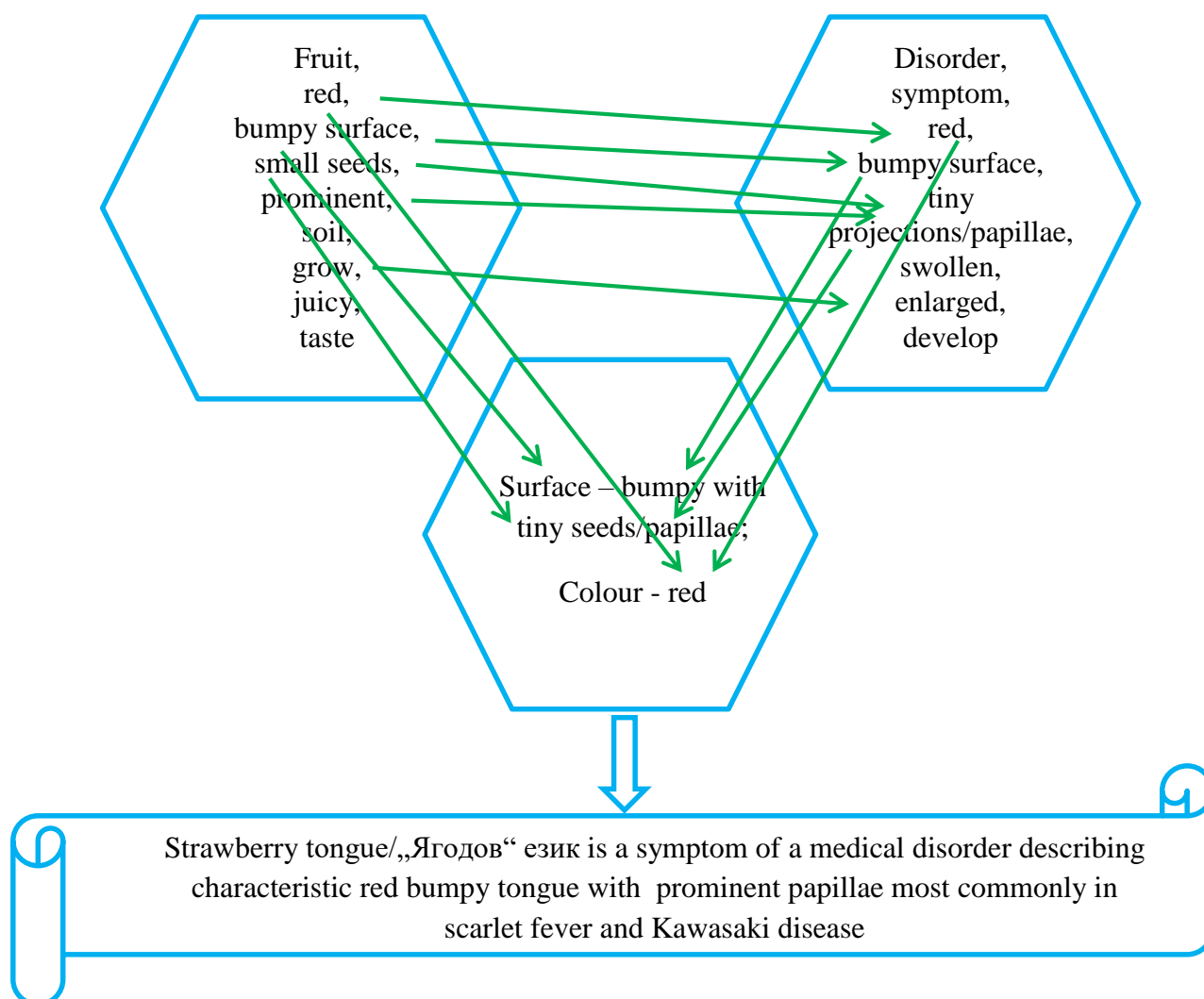


Fig. 3. Framework model of English phytomorphic metaphorical term “Strawberry tongue”



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Regarding the phytomorphic metaphor “Strawberry tongue” two input mental spaces - source-input space 1, target-input space 2 – are formed with specific semantic fields of two concepts: strawberry and medical symptom. Several constituents are suggested as involved in depicting the first concept strawberry - fruit, red, bumpy surface, small seeds, prominent. They express at best the conceptual content of the source domain and in mapping over the target domain conceptual content our linguistic consciousness associates red congested papillae surface of a tongue with red bumpy surface of a strawberry.

A vivid association between papillae as anatomical concept and seeds as flora concept is realized. The obvious resemblance is a key to the door of the common coordinating space - the generic one. There the relationship between both input spaces (source/target) is made explicit by means of the nominative signs surface (bumpy with tiny seeds/papillae) and colour (red). These are the shared lexemes by the input spaces which are ready to turn into terms and thus to take part in blending where the conceptual dimension of the new terminological unit Strawberry tongue is formed as a symptom of a medical disorder.

Only the constituents associated with taste (juicy) and place (soil), due to their close connection with flora, remain beyond the scope of the conceptual content of the newly emerging terminological metaphor. The stages of formation of the four-frame model of the terminological metaphor “Strawberry tongue” can be followed up in figure 3.

**Conclusions.** The observations and analyzes made, as well as the results obtained regarding the researched English metaphorical corpus of 84 phytomorphic terminological metaphors excepted from the medical discourse and belonging to the non-anthropogenic metaphorical model “Fauna”, allowed the following conclusions to be drawn:

1. Mapping of real-world objects lexis and medical terms in input mental spaces - source-input space 1, target-input space 2.

2. A process of unifying the common conceptual dimension in the semantic fields of the two input spaces (source-input space 1, target-input space 2.) and forming a generic mental space with certain motivational features: shape, place, function, surface, consistency, smell, colour.

3. Terminologicalization of constituent lexemes in conceptual blending and generating of a new metaphorical unit with a new conceptual dimension different from that of its structuring elements.

4. Phytomorphic metaphor from English medical corpus studied nominates mainly anatomical objects (brain stem/мозъчен ствол; eye-ball/очна ябълка), symptoms and syndromes (cauliflower ear/ухо на карфиол - in trauma with blood clots and tissue injury; clover-leaf skull/краниосиностоза – premature closure of cranial sutures) and diseases (nettle rash/копривна треска; pemphigus foliaceus/пемфигус тип листовиден – autoimmune disease).

5. The levels of information processing for all English phytomorphic metaphorical terms excepted from the medical discourse and studied (84) follow the algorithm of Fauconnier and Turner's four-frame model.

Metaphor in medicine indicates and makes sense, reaching the cognitive depth of words. Possessing a wide conceptual range, involving in its dynamics of development perceptions, emotions, thought, language, experience, it increasingly necessitates its study in the context of teaching medical terminology, its acquisition and application in daily clinical practice. The proposed model of teaching metaphorical medical terminology - Fauconnier and Turner's four-frame model - may prove to be only the beginning of a number of other models created in the service of medical education.

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**Сведения об авторе:**

**Танева Светлана Йорданова**, Доктор филологии, главный ассистент, Факультет общественного здоровья. Медицинский университет, пр-т Академика Гешова 15, 1431, София, Болгария. E-mail: [svetlanataneva@abv.bg](mailto:svetlanataneva@abv.bg) Тел.+359 887 679 651, ORCID: <https://orcid.org/0000-0002-1348-0029>

**Сведения об авторе на английском:**

**Taneva Svetlana Yordanova**, PhD, chief assistant, Faculty of Public Health. Medical University, 1431, 15 Academician Geshov Blvd., Sofia, Bulgaria. E-mail: [svetlanataneva@abv.bg](mailto:svetlanataneva@abv.bg) Тел.+359 887 679 651, ORCID: <https://orcid.org/0000-0002-1348-0029>