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Топология-образность лексических основных и метафорических значений «слов года» на английском, китайском и русском языках

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Аннотация. Цель данного исследования – выяснить распределение когнитивной и перцептивной информации (КПИ) в метафорических значениях слов года на английском, китайском и русском языках и их базовые топологические схемы. Научная новизна этого исследования заключается в объяснении когнитивной и перцептивной информации в лексической семантике на основе гипотезы топологии-образности, предложив новую когнитивную перспективу для понимания лексической семантики. На основе аннотирования типов когнитивной и перцептивной информации в словах года на английском, китайском и русском языках в течение десяти лет, в данном исследовании сравниваются когнитивные сходства и различия в метафорических значениях этих языков и исследуются лежащие в их основе когнитивные схемы-образы. Результаты показывают, что пять типов когнитивной и перцептивной информации составляют основные когнитивные механизмы в семантических отношениях между базовыми и метафорическими значениями, при этом структурные отношения (тип 3) выделяются как основной когнитивный механизм для этих языков. Кроме того, в исследовании выявлены структурные отношения (тип 3) и сценарии (тип 4) как наиболее распространенные типы в словах года на английском, китайском и русском языках. В основе когнитивной и перцептивной информации два топологических образца определяются как универсальные методы для понимания лексической семантической информации.

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The topology-imagery of lexical basic and metaphorical meanings: the cases of Words of the Year in English, Chinese, and Russian

Junwen Jia

Abstract. The aim of this study is to elucidate the distribution of cognitive and perceptual information (CPI) in metaphorical meanings of Words of the Year in English, Chinese, and Russian and their underlying topological patterns. The novelty of this research lies in explaining cognitive and perceptual information in lexical semantics based on the topology-imagery hypothesis, offering a new cognitive perspective on lexical semantic understanding. By annotating the CPI types of Words of the Year in English, Chinese, and Russian over a span of ten consecutive years, this study compares the cognitive similarities and differences in metaphorical meanings across these languages and explores the underlying cognitive image-schematic patterns behind these similarities and differences. The findings reveal that five types of cognitive and perceptual information constitute the core cognitive mechanisms in the semantic relationships between basic and metaphorical meanings, with structural relationships (Type 3) emerging as a core cognitive pattern across these languages. Furthermore, the study identifies structural relationships (Type 3) and scenarios (Type 4) as the most prevalent types within English, Chinese, and Russian Words of the Year. Underlying cognitive and perceptual information are two topological patterns identified as universal methods for understanding lexical semantics.

Introduction

Rather than adhering to the traditional view that words possess fixed, singular meanings, it becomes evident that semantic networks are dynamic, capable of adopting multiple interpretations that evolve with their contextual application and the underlying cognitive frameworks. Investigating the complexities of semantic shifts across diverse cultural landscapes underscores the necessity of a robust understanding of cognitive mechanisms.

The research relevance of this article can be determined by the following. In the field of cognitive linguistics, research on cognitive and perceptual information in lexical semantics is of paramount importance. However, the types of cognitive and perceptual information in lexical semantics across different languages remain poorly defined.

Words of the Year exhibit complex and pervasive metaphorical meanings. Analyzing the CPI in these terms across different languages is crucial for identifying the cognitive mechanisms underlying lexical semantics. Moreover, establishing these cognitive topological patterns is foundational for understanding the semantics of diverse lexical items, thereby enhancing our comprehension of lexical semantics across different languages and cultures.

This study addresses two primary tasks: 1) identifying the classifications of cognitive and perceptual information within lexical semantics, as well as the classification of topological patterns that underpin this information; 2) comparing the similarities and differences in the distribution of this cognitive and perceptual information across different languages, using Words of the Year as the data set.

The research employs a combination of descriptive, quantitative, and comparative methods. The descriptive method is used for classifying cognitive and perceptual information in lexical metaphorical meanings and their topological patterns. The quantitative method is employed for the analysis of corpus data. The comparative method is utilized to compare the distribution of this cognitive and perceptual information within lexical semantics across different languages.

The study materials included the English, Chinese, and Russian Words of the Year from these ten consecutive years. The English corpus was sourced from Merriam-Webster, known for its extensive coverage of English lexicon. For the Chinese analysis, the corpus was derived from "咬文嚼字," a publication celebrated for its deep insights into linguistic trends and subtleties within the Chinese language. The Russian linguistic corpus was compiled from several respected sources, including "Грамота.ру" and other authoritative references, ensuring a robust basis for exploring spatial constructs in the Russian context. The sources of the materials are as follows:

	English	Chinese	Russian
2023	https://www.merriam-webster.com/wordplay/word-of-the-year	http://sc.people.com.cn/n2/2024/0104/c345167-40702982.html	https://gramota.ru/journal/novosti-i-sobytiya/neyroset-slovo-2023-goda-po-versii-gramoty?ysclid=ls5su4f1s4860127089
2022	https://www.merriam-webster.com/wordplay/word-of-the-year-2022	http://henan.china.com.cn/edu/2022-12/26/content_42215362.htm	https://radiosputnik.ru/20221227/slova-1841671924.html
2021	https://web.archive.org/web/20230705124835/https://www.merriam-webster.com/words-at-play/word-of-the-year-2021-vaccine/vaccine	http://bj.people.com.cn/n2/2021/1209/c82846-35042692.html	https://mel.fm/novosti/7039158-institut-pushkina-nazval-samoye-populyarnoye-slovo-2021-goda?ysclid=ls5t7c36xr416868075
2020	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://www.trud.ru/article/11-11-2020/1396252_v_rossii_nazvany_slova_goda.html?ysclid=lsan5idtj1483605128
2019	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://web.archive.org/web/20220120150043/https://snob.ru/profile/27356/blog/162528/
2018	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://news.rambler.ru/other/41422542/?utm_content=news_media&utm_medium=read_more&utm_source=copylink
2017	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://www.rbc.ru/society/26/12/2017/5a41825c9a7947a16649dd66?ysclid=lsanh1r7om293214565
2016	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://news.rambler.ru/europe/35742728-podvedeny-lingvisticheskie-itogi-2016-goda/?ysclid=lsanpg7agg951894154
2015	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://y11.d4t.cn/JzpvmN
2014	https://en.wikipedia.org/wiki/Lists_of_Merriam-Webster%27s_Words_of_the_Year#2003	http://www.360doc.com/content/20/1212/06/10240337_951033277.shtml	https://www.facebook.com/groups/slovogoda/posts/702002849907268/

The solution to the proposed tasks was made possible by the following theoretical background: cognitive research on lexical metaphorical meanings (Lakoff, 1980, 1987, 1990; Sweetser, 1991; Kövecses, 2005; Fauconnier & Turner, 2006; Robert, 2008; Vicente, 2018) and cognitive image-schemas in lexical semantics (Lakoff, 1980, 1987, 1990, 2014; Gibbs, 2006, 2008). Furthermore, prior studies have extensively explored perceptual information within languages (Williams, 1976; Zhao, 2019; Pishghadam, Jajarmi, Shayesteh, 2016), demonstrating the significance of perceptual information in language. Additionally, research on spatial thinking in language by scholars such as Regier (1995), Levinson (1996), Langacker (1987, 1991, 2014), and Talmy (1991, 2000) has further supported this study.

The practical significance of this investigation lies in its contribution to a broader understanding of how perception and cognition shape semantic relationships, offering valuable perspectives for future research in cognitive linguistics and semantics. Specifically, the findings can be integrated into academic curricula for courses and seminars focused on cognitive linguistics, semantics, and language education. By incorporating these insights into lectures and seminars, educators can adopt a more interactive and cognition-focused analytical method, enhancing

the teaching of these disciplines. Furthermore, the results of this research can be utilized in the development of textbooks and educational materials, enriching the instructional resources available for these subjects.

Results & Discussion

The investigation into the semantic interplay between basic and metaphorical meanings is intrinsically linked to a comprehensive understanding of cognitive image-schemas (Lakoff, 1987, 1990; Gibbs, 2006). This connection underscores the importance of understanding the cognitive frameworks that underpin the generation and interpretation of semantic relationships, positioning metaphor and metonymy as fundamental elements in the cognitive linguistic landscape.

Spatial imagery is at the core of cognitive image-schemas (Langacker, 1987; Talmy, 1991, 2000). Within the framework of conceptual blending theory, the concept of "generic space" is identified as a crucial nexus for forging connections among semantic variations (Fauconnier & Turner, 2006). At its core, this generic space is essentially anchored in image-schemas, establishing the mental spatial basis for enabling intricate semantic associations and integrations. Furthermore, George Lakoff's pioneering work on the classification of metaphors significantly highlights the foundational role of orientational metaphors in the cognitive interpretation of metaphorical meanings. Lakoff (1980, 2014) articulates that orientational metaphors are not merely one among three metaphor types; instead, they fundamentally serve as the cornerstone upon which other metaphorical structures are erected. Thus, spatial thinking is identified as one of the most elementary functions of the human physiological apparatus. This point is robustly supported by scholars such as Regier (1995), Levinson (1996), and Palmer et al. (2014), who collectively emphasize the primacy of spatial reasoning in human cognition. Consequently, spatial thinking sheds light on the critical extent to which spatial concepts are integral to conceptualization of abstract notions (Landau & Jackendoff, 1993; Landau & Lakusta, 2006), thereby positioning orientational metaphors as a crucial cognitive mechanism. This mechanism aids in the translation of complex, ethereal concepts into intelligible language, facilitating a deeper semantic understanding.

The cognition of spatial imagery relies on topological patterns, which include common types such as containers (Lakoff, 1980, 1987) and lines. These topological patterns can be categorized into closed and open types based on the characteristics of topological space. Containers represent closed spaces, whereas lines represent open spaces. Thus, the hypothesis of this study is that the cognition of lexical semantics requires topology-imagery to process the rich information contained in lexicon. Lexical semantics is rich and diverse, necessitating core cognitive patterns for its processing.

Moreover, lexical semantics encompasses various types of cognitive and perceptual information (CPI) (as illustrated in Figure 1), including perceptual information such as shape and size (Landau & Jackendoff, 1993) and other forms of linguistic synesthesia (Williams, 1976; Caballero & Paradis, 2015; Zhao et al., 2019). It also includes cognitive information such as structural relationships (Lakoff, 1980, 1990; Gibbs, 2006, p. 246-248) and complex scenarios. These types of information can be compared through cognitive topology-imagery, thereby enhancing our understanding of the semantic content in lexicon. Firstly, shape information in lexicon can be understood through topological patterns such as lines. Common lexical shapes include circles and triangles, which correspond to different points on a line, representing various emotional polarities and thus forming the main content of derived metaphorical meanings in different words. Secondly, size information in lexicon, including concepts of smallness and largeness, can also be mapped to different points on a line using the same method. For example, the concept of "small" is often associated with negative emotional connotations, while "large" is associated with positive emotional connotations. Other sensory-related words can be compared using this method as well. Furthermore, structural relationship can be understood through topological patterns like containers, such as the understanding of the concepts of "inside vs outside" or "up vs down" in lexicon. For instance, the concept of "up vs. down" is often used to express social hierarchy. Finally, scenario information can also be understood through topological patterns like containers, where related lexical items within the same scenario can be considered elements within a container.
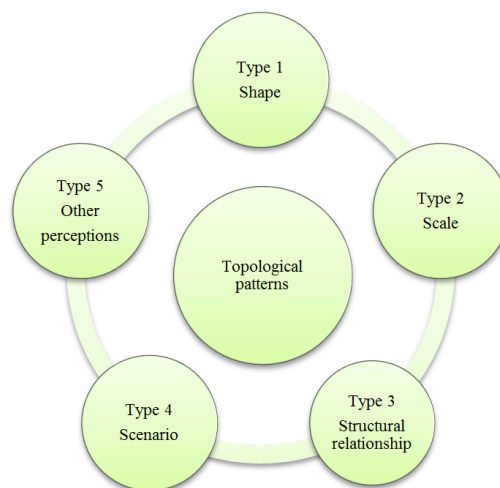

Figure 1. *Types of cognitive and perceptual information*

2.1 Results

1) Corpus Annotation

The annotation process was meticulously conducted, focusing on categorizing lexical meanings based on the classification of the CPI inherent in their semantic relationships. This structured methodology facilitated the thorough identification and analysis of five types of CPI present within the basic and metaphorical meanings across the corpus.

Two annotators meticulously labeled the collected corpora, and the reliability of their annotations was assessed to ensure the reliability of lexical annotations. The results indicated an exceptionally high level of inter-annotator agreement, with a Cronbach's alpha coefficient of 0.996 (Table 1), demonstrating the internal consistency and reliability of the annotations. This high reliability further ensures the robustness and validity of the study's findings.

Table 1. *Reliability Statistics*

Reliability Statistics (Cronbach Alpha)			
Items	Corrected Item-Total Correlation (CITC)	Cronbach Alpha if Item Deleted	Cronbach α
annotator1	0.991	-	0.996
annotator2	0.991	-	
Cronbach α (Standardized): 0.996			

2) Corpus Limitations

It is important to note the inherent complexities and limitations within the Russian corpus. Unlike in English and Chinese, where the trend of announcing a fixed number of "words of the year" is common, Russian words of year are not published annually in a set quantity by official bodies. Official releases typically focus on individual words, whereas linguists and language enthusiasts often compile lists of multiple words of year following the English tradition to better reflect societal phenomena. This practice introduces a layer of complexity to the Russian corpus, as the sources of words are diverse and their selection can be subjective, reflecting a broader range of social phenomena and linguistic nuances.

3) Results

By analyzing the CPI types in the lexical meanings of English, Chinese, and Russian over a decade, this study has uncovered insights that shed light on the subtleties of spatial cognition within lexical semantics and revealed commonalities, while also identifying both commonalities and differences:
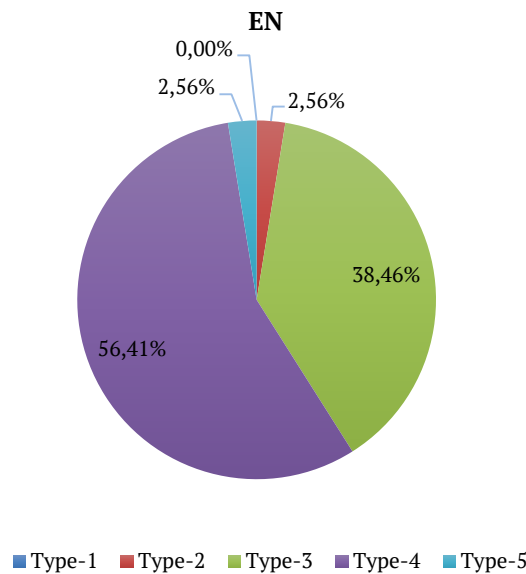

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0,00% 2,56% 2,56% 38,46% 56,41%

■ Type-1 ■ Type-2 ■ Type-3 ■ Type-4 ■ Type-5

Figure 2. *The Distribution of cognitive and perceptual information in Words of Year in English*

As illustrated in Figure 2, in the English Words of the Year, the majority of CPI is categorized within Type 4, representing 56.41% of the analyzed terms. Notable examples include "authentic," "rizz," "raid," "woke," "nomad," "icon," "egregious," and "camp." Subsequently, Type 3 emerges as the next significant category (38.46%), encompassing prevalent buzzwords such as "deepfake," "implode," "deadname," and "meta."

As depicted in Figure 3, similar to English, in the realm of Chinese Words of the Year, the largest proportion of CPI falls under Type 4 (42.31%), with frequently mentioned terms including "特种兵式旅游" (special forces-style tourism), "烟火气" (hustle and bustle), "拿捏" (grasping firmly), "雪糕刺客" (ice cream assassin), "赶考" (rushing to exams), and "躺平" (lying flat). Following this, Type 3 accounts for a significant segment, with common words such as "新质生产力" (new quality productivity), "双向奔赴" (mutual endeavor), and "新赛道" (new track). Unlike the other two languages, Chinese exhibits a higher proportion of Types 2 and 5 in its buzzwords, which is related to the lexical semantic structure of Chinese.
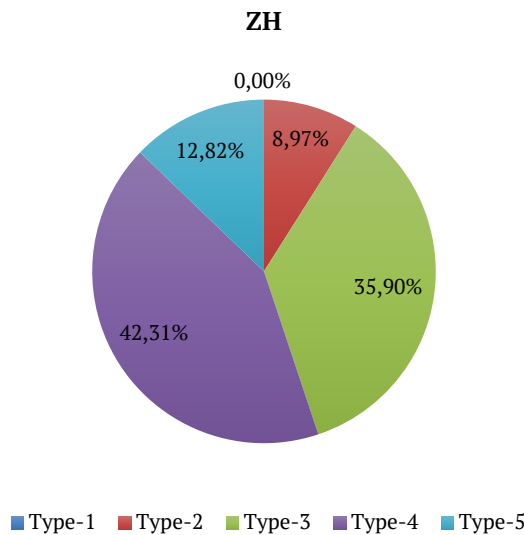
ZH

Type-1 Type-2 Type-3 Type-4 Type-5

Figure 3. *The Distribution of cognitive and perceptual information in the Words of Year in Chinese*

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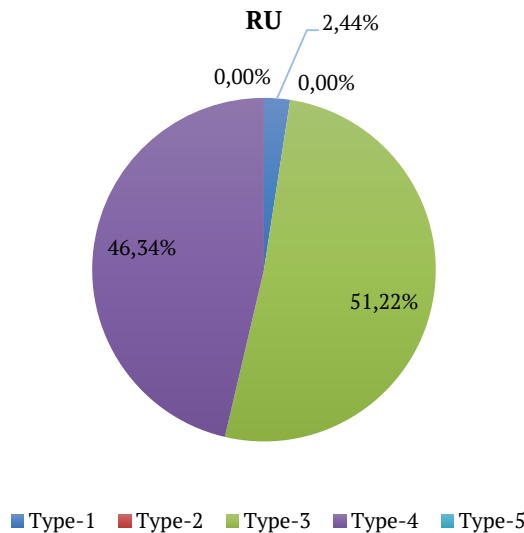Type-1 Type-2 Type-3 Type-4 Type-5

Figure 4. *The Distribution of cognitive and perceptual information in the Words of Year in Russian*

As demonstrated in Figure 4, contrary to English and Chinese, the most prominent category of CPI in Russian terms is Type 3 (51. 22%), with prevalent terms including "нейросеть" (neural network), "база" (base), "возвращенцы" (returnees), and "антипрививочник" (anti-vaxxer). Following this, Type 4 constitutes the next significant category, featuring buzzwords such as "наследие" (legacy), "поправка" (amendment), "токсичный" (toxic), and "война" (war). The recurrence of annual words in Russian is tied to the current national context.
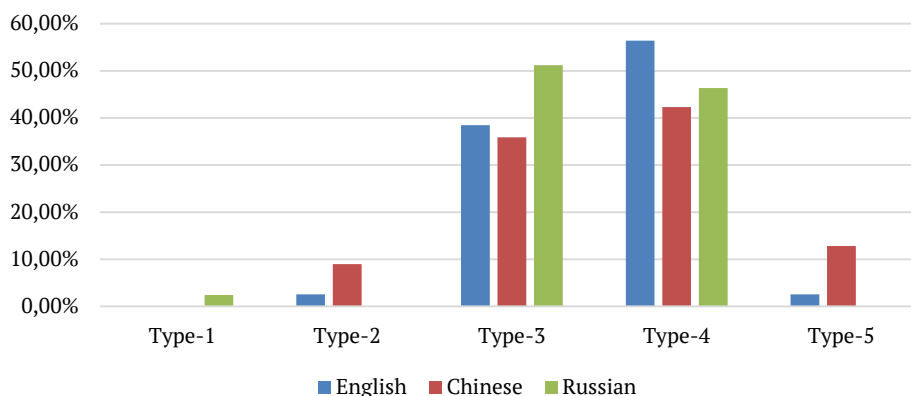

English Chinese Russian

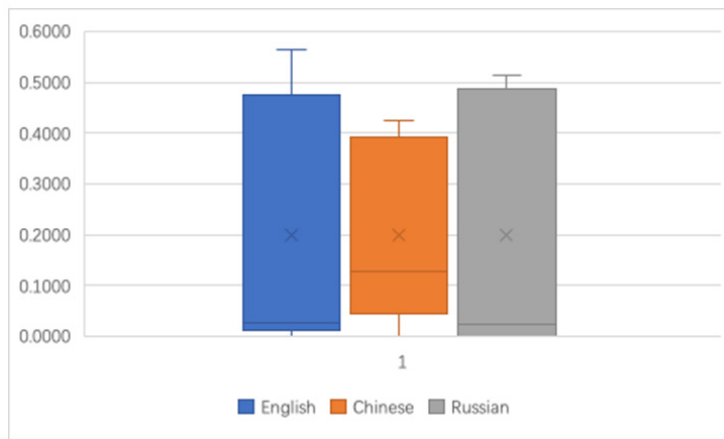**Figure 5.** *Comparative Analysis of CPI Types*

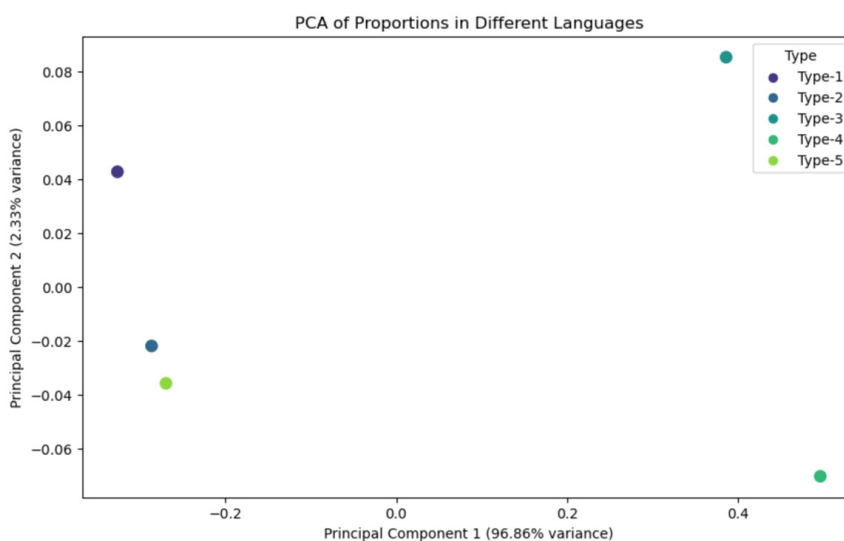**Figure 6.** *Box Plot of Proportions in Different Languages*

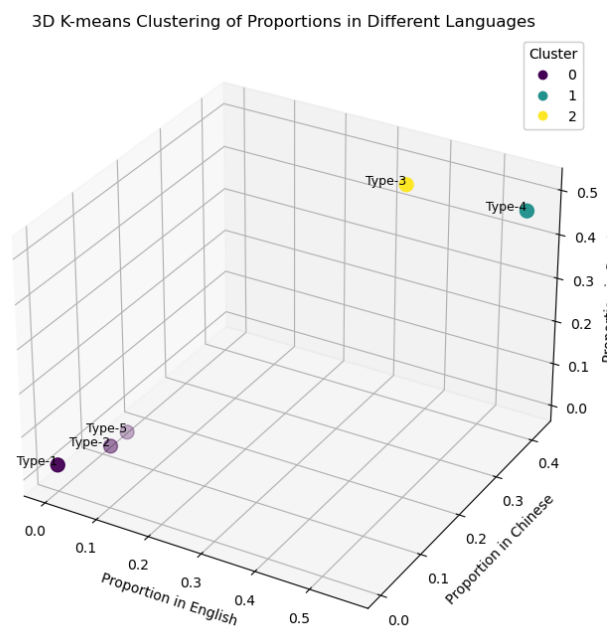**Figure 7.** *Principal Component Analysis of Proportions in Different Languages*

Figure 8. *K-means Clustering of Proportions in Different Languages*

As depicted in Figure 4, in the annual lexicon of English, Chinese, and Russian, the relationship between basic and metaphorical meanings is primarily concentrated in Types 3 and 4. Additionally, over the last decade, the popular lexicon in these languages has not encompassed terms related to spatial shapes. The proportion of spatial imagery within these lexical semantics also mirrors the distinct thought patterns and cultural characteristics of different ethnic groups.

Using exploratory data analysis (EDA), principal component analysis (PCA), and K-means clustering with Python 3, we aim to determine if Type 3 is a core factor across these languages.

Exploratory Data Analysis (EDA) was conducted to examine and visualize the data, uncovering potential patterns. The bar charts (as shown in Fig. 5) illustrated the distribution differences of each lexical type across the three languages (English, Chinese, and Russian). Box plots (Fig. 6) displayed the dispersion of proportions in different languages, revealing significant distribution variance. The mean proportion across all languages was approximately 0.20, but the standard deviation was high, indicating substantial variation in the data. Notably, Type 3 exhibited a high proportion in all languages.

Principal Component Analysis (PCA) (as shown in Fig. 7) was employed to reduce the dimensionality of the data and identify the main factors contributing to variance in the distribution of lexical types. The explained variance ratios are as follows: Principal Component 1 (PC1) accounts for 96.86% of the variance, while Principal Component 2 (PC2) accounts for 2.33% of the variance. The scatter plot from the PCA showed that Type 3 is relatively concentrated along PC1, indicating its significant contribution to the overall data variance.

K-means clustering was performed to categorize the data into distinct groups based on the distribution of lexical types across the three languages. The clustering analysis resulted in three clusters. The results indicated that Type 3 formed a separate cluster (Cluster 2), while other types were distributed across the remaining clusters (Fig. 8).

In summary, the data analysis revealed that Type 3 makes a significant contribution to the overall data and exhibits a distinctive distribution across different languages. This finding underscores the unique role of Type 3 in the semantic structure of the three languages studied. The combination of EDA, PCA, and clustering analysis provides a comprehensive understanding of the lexical type distributions and their cognitive implications.

2.2 Discussion

This study meticulously explores the spatial cognition underpinning the semantic transformation of language, focusing on Types 3 (structural relationships) and Type 4 (scenarios) across English, Chinese, and Russian lexicons. These classifications illuminate the cognitive underpinnings that facilitate the comprehension and creation of metaphorical meanings, underscoring the significance of spatial imagery in lexical semantics.

2.2.1 Structural Relationships (Type 3)

Type 3 highlights the cognitive structural relationships among entities, focusing on relative relationships (primary-secondary; new-old), inside-out, and composite relationships. These relationships can be explained through topological patterns: inside-out forms different boundary relationships within a container, while new-old establishes sequential relationships along a line. This emphasis reveals the profound integration of topological patterns within lexical semantics, illustrating how these spatial configurations are intricately woven into the tapestry of language meaning.

In English, the conceptualization of spatial structural relationships is vividly illustrated through various linguistic expressions. Examples include:

Relative Relationship: The word *"deepfake"* exemplifies a nuanced, deeper spatial construct beyond its superficial counterpart, highlighting a layered complexity. Likewise, The English buzzword *"insidious"* draws a stark contrast to the overt and superficial, encapsulating subtlety and hidden danger. The word *"innovation"* stands as a beacon of new methodologies, diverging from traditional approaches. Moreover, *"omicron"*, signifying the 15th letter of the Greek alphabet, transcends its alphabetic sequence to classify virus strains, embodying a systematic approach to scientific taxonomy. The English Word of Year *"Lodestar"*, symbolizing the North Star, emerges as the quintessential guide, thus adopting the metaphorical essence of a pivotal goal or guiding principle within a hierarchical context. The concept of *"implode"* reveals an intricate spatial dynamic that transitions from the interior to the exterior, capturing a profound transformation process.

Composite Relationship: The notion of *"elemental"* captures the essence of fundamental forces – air, water, fire, and earth – transitioning to broader compositional scenarios and elements, reflecting intricate mental spatial compositional relationships. *"Cisgender"* further elaborates on these spatial compositional constructs, with symbolizing alignment on the same side of a spectrum, thereby enriching the linguistic tapestry of spatial interpretation in English.

In Chinese, the articulation of spatial structural concepts is adeptly captured through a rich tapestry of linguistic expressions. Examples include:

Relative Relationship: The nuanced use of "新" (new) in terms like the words of year "新赛道" (new track) and "新常态" (new normal) establishes a dynamic contrast with the established or old, heralding a structured yet layered categorization. This notion extends to "赛道" (track), which vividly reimagines a spatial scenario. Terms such as "不忘初心" (never forget the original intention), where "初" (original, beginning) underscores the inception point, further enrich this stratification. Moreover, expressions like "高大上" (high-end), "人民至上、生命至上" (people first, life first), alongside phrases such as "××千万条，××第一条" (millions of reasons, but ×× comes first) and "顶层设计" (top-level design), leverage "上" (above, top) and "第一" (first) to accentuate the essence of precedence and superiority. Additionally, "天花板" (ceiling) and "碳达峰，碳中和" (carbon peak, carbon neutrality) delineate the spatial dimensions of high and low, while "后浪" (literal: later wave, younger generation) signifies the emergent, transcending mere chronological succession. The expressions "破防" (breaking defenses) and "内卷" (internal strife) vividly portray directional movements towards the interior, encapsulating a profound shift from the external to the core.

Composite Relationship: Words of year such as "双循环" (dual circulation), "双减" (dual reduction) and "双向奔赴" (mutual endeavor) highlight the dual relationships of composite structures embedded in spatial frameworks. Likewise, "文明互鉴" (mutual learning between civilizations) symbolizes mutual composite connections. The distinct delineation in "我不要你觉得，我要我觉得" (It's not about what you think, it's about what I think) differentiates self from others, clarifying the boundary between the subject and object. In contrast, terms like "命运共同体" (community with a shared future) and "共享" (sharing) highlight the synthesis of disparate elements into a unified whole. "供给侧" (supply side) articulates a composite relationship that bridges the "demand side" and "supply side," while "区块链" (blockchain) champions the notion of an integrated entirety.

In Russian, the exploration of spatial concepts is intricately woven into the fabric of language, offering profound insights into hierarchical and relational dynamics:

Relative Relationship: The lexicon showcases foundational contrasts, with terms like *"база"* (base) and *"дно"* (bottom) delineating the extremes of structural layers. The terms *"новичок"* (novice) and *"стартап"* (startup) emphasize new layers of hierarchy, built upon and extending the existing ones. The nuanced delineation of internal versus external realms is captured through terms such as *"возвращенцы"* (returnees) and *"репосты"* (reposts), marking the thresholds of spatial boundaries. Russian language frequently employs such demarcations, with phrases like *"Допускай!"* (Allow!) and *"Отпускай!"* (Let go!), serving as linguistic beacons that guide the understanding of spatial boundaries, enriching the dialogue on spatial orientation and structure.

Composite Relationship: The term *"нейтросеть"* (neural network) captures the essence of interconnectedness, portraying a vast network of links. *"имба"*, a colloquial term, signifies a harmonious balance within a composite structure, illustrating the complexity of Russian linguistic patterns. The 2021 buzzwords *"антипрививочник"* (anti-vaxxer), *"антиваксер"* (anti-vaxxer), *"нерабочий" (non-working)*, and *"безвиз"* (visa-free) epitomize the synthesis of dual entities, weaving a rich tapestry of composite structures.

In all three languages, there is a significant presence of Type 3 annual lexicons, which primarily highlight hierarchical, composite, and inside-out structures, which plays a crucial role in the deep understanding and application of vocabulary.

2.2.2 Type 4: Scenarios

Type 4, scenarios, delve into the art of language, transforming it into a medium for the metaphorical reenactment of experiences and memories. It employs bodily perceptions to reconstruct scenes, thereby deepening our comprehension and emotional resonance with the language. The topological pattern "container" of this category includes numerous elements specific to the scenario, as well as elements that cross multiple scenarios.

English terms, with its rich linguistic heritage and dynamic evolution, offers a unique vantage point from which to explore the intricate interplay between language, memory, and perception. Examples include:

Cross-Domain Scenario Representation: The Word of Year *"raid"* transcends its original military connotation to depict a focused assault on a particular objective, illustrating the versatility of language in drawing parallels across different realms. *"Nomad"* evolves to describe modern lifestyles characterized by frequent job changes, capturing the essence of transient existence. *"Gaslighting"* vividly brings to life a specific psychological manipulation scenario. *"Guardian"* broadens its scope to signify protection in various scenarios, embodying the adaptability of roles. The usage of *"icon"* in the words of year 2016 and 2020 across diverse fields exemplifies the fluidity of symbolic representation, merging historical reverence with contemporary relevance. *"Culture,"* with its expansive narrative, encapsulates both collective experiences and abstract notions, demonstrating language's power to encompass a spectrum of human activity.

Scenario-Associated Evaluative Perception Reproduction: The Word of Year *"authentic"* serves as a linguistic portal to scenarios echoing genuineness, enhancing the value attributed to authenticity. Conversely, *"egregious"* embodies scenarios that provoke negative emotional reactions, highlighting the impact of language in evoking sentiment. Through these expressions, language not only narrates but also invokes a rich tapestry of sensory and emotional experiences, demonstrating its capacity to bridge tangible reality and abstract perception.

In Chinese, the nuanced tapestry of language serves as a portal to both historical depth and contemporary resonance, showcasing the enduring legacy and adaptive prowess of linguistic expressions:

Classical Scenario Representation: Classical ancient myths and legendary creatures are reimagined in modern narratives, where mythical beasts and "锦鲤" (koi), emblematic of fortune, transition into symbols of strategy and luck in today's societal discourse. Classical artistic references, such as "凡尔赛文学" (Versailles literature), draw from the elegance of the "Versailles Rose" manga to critique contemporary social pretensions with a nuanced subtlety. The "葛优躺" (Ge You slouch, Ge You: a Chinese famous actor) meme, originating from cinematic culture, evolves into a symbol reflecting societal attitudes and states of being.

Cross-Domain Scenario Representation: "烟火气" (smell of cooking; hustle and bustle), once a literal descriptor of culinary scenes, now encapsulates the essence of life's vibrancy, painting a picture of the mundane yet meaningful facets of existence. Everyday lexicon like "躺平" (lying flat) and "赶考" (rushing for exams) extend beyond their literal bounds to capture the zeitgeist of contemporary youth and the competitive spirit in the socio-political arena, respectively. Moreover, "打工人" (working people) and "996" (the 996 work schedule) articulate the realities of the labor market, transforming into commentary on work culture and personal sacrifice. The playful yet pointed "X党" (X party) series, including "剁手党"(spendthrifts), mirrors consumer behavior and societal trends. This exploration extends into vivid recreations of intense experiences, as seen with "特种兵式旅行" (special forces-style tourism), which dramatizes the rigors of military training within everyday contexts.

Scenario-Associated Evaluative Perception Representation: The evocative power of language to mirror and mold evaluative perceptions is exemplified through the nuanced interplay of terms like "可能×××假×××" (possibly fake ×××), which navigates the delicate boundary between authenticity and illusion, reflecting a societal preoccupation with discerning truth from falsehood. The prevalence of Chinese buzzwords infused with political narratives, such as the 2022 rallying cry "踔厉奋发、勇毅前行" (strive vigorously and march forward bravely), underscores the language's capacity to encapsulate collective aspirations and valorize determination. The lexicon further diversifies as certain verbs ascend to buzzword status, capturing the zeitgeist through the lens of action and emotion. The word "飒" (cool), originally evoking the refreshing sound of the wind, transcends its initial context to describe traits of poise and resilience. Similarly, expressions like "尬" (awkward) and "怼" (confront) distill complex interpersonal dynamics into succinct, resonant terms. Language also serves as a canvas for depicting processes and transformations, with verbs like "断舍离" (decluttering) articulating journeys of introspection and liberation. The progression from "质疑" (question) to "理解" (understand), and finally to "成为" (become), traces the arc of personal growth, emphasizing the inherent dynamism of understanding and becoming.

The common use of stylistic constructs such as "X式" and "X系"(X-style) further enriches this narrative, with phrases like "教科书式" (textbook-style) and "断崖式" (cliff-style) evoking specific qualities of meticulousness and precipitous change, respectively. The concept of "佛系" (Buddhist-style), with its spiritual undertones, epitomizes an ethos of detachment and tranquility, offering a linguistic reflection of a serene approach to life's vicissitudes. Through these linguistic manifestations, Chinese not only captures the essence of experiences and emotions but also shapes the collective consciousness, bridging individual experiences with broader societal values and aspirations.

In Russian, the evocative force of language meticulously resurrects historical and contemporary scenes, showcasing a profound capacity for narrative and conceptual depth:

Classical Scenario Representation: The reinvocation of historical moments through terms such as *"денацификация"* (denazification) and *"демилитаризация"* (demilitarization) demonstrates the linguistic ability to weave complex historical narratives into the fabric of present discourse. These terms not only recount past strategies and ideologies but also embed them within a contemporary framework of understanding, bridging time through linguistic expression.

Cross-Domain Scenario Representation: The term *"наследие"* (heritage), resonating with the broad sweep of "culture" in Russian, captures the essence of inheritance and tradition, reflecting the intricate layers of Russian history and identity. *"конституция"* (constitution) transcends its legal origins to encapsulate foundational structures, mirroring the complexity of societal constructs. The recurrence of *"война"* (war) in recent discourse, particularly in 2014 and 2016, signifies a shift from strictly military connotations to broader interpretations of conflict, underscoring the adaptability of language to reflect evolving national sentiments. *"Санкция"* (sanctions) similarly navigate from the realm of law to wider social and political implications, illustrating the dynamic interplay between decision-making and societal impact.

Scenario-Associated Evaluative Perception Representation: The emergence of *"токсичный"* (toxic) in 2016 and 2017 as a buzzword encapsulates the transformation of language to convey complex emotional landscapes, specifically those tinged with negativity. This term, in its versatility, underscores the potency of language in Russian to distill and communicate the nuances of evaluative perception, embedding deep emotional resonance within succinct expressions.

Through these linguistic phenomena, English, Chinese and Russian Words of the Year reveal its intrinsic ability to transcend mere communication, acting instead as a conduit for collective memory, cultural identity, and emotional expression. Language, in this context, becomes a living archive of the past and a mirror to the present, continually reshaped by the hands of history and the pulses of contemporary life.

2.2.3 Scale (Types 2) and other perceptional interpretations (Type 5)

Type 5, other perceptional interpretations, in recent years, showcases the rich tapestry of the Chinese language as it embraces an increasing array of emotional and sensory words. This linguistic phenomenon blurs the lines between the senses, offering a multifaceted exploration of human experience through language:

Emotional and Sensory Convergence: The terms "情绪价值" (emotional value) and "精神内耗" (mental internal friction) exemplify the nuanced articulation of inner psychological states, reflecting a societal shift towards acknowledging the complexity of emotional and mental well-being. The application of "多巴胺" (dopamine) beyond its biochemical context into "多巴胺穿搭" (dopamine dressing) signifies a cultural movement towards elements that not only evoke but celebrate positive emotional responses, embodying the tangible intersections between biochemistry and aesthetic expression.

Sensory Expansion: The lexicon extends into sensory dimensions with terms like "软硬" (soft-hard), culminating in the buzzword "硬核" (hardcore), which signifies extremity and resilience. Similarly, "有温度" (warmth) captures the physical sensation of temperature to describe emotional warmth and intimacy, illustrating the language's capacity to encapsulate complex human sensations. "酸甜苦辣" (sour, sweet, bitter, spicy), traditionally associated with gustatory experiences, gives rise to "柠檬精" (lemon essence), a term that marries the sour taste with the nuanced emotion of jealousy, showcasing the innovative use of taste to express complex emotional states. Furthermore, "油腻" (greasy) transcends its dietary origin to critique certain social behaviors, demonstrating the adaptability of gustatory terms in social commentary.

Visual and Symbolic Representations: The color "红色" (red), emblematic of positivity and success in Chinese culture, evolves linguistically to embody the act of achieving fame, as seen in "网红" (internet celebrity), highlighting the visual symbolism's power in shaping social identity and aspirations.

Compared to the linguistic landscape in Chinese, English presents a more restrained engagement with such synesthetic interpretations over the past decade. The term *"sentient,"* denoting a broad spectrum of perception, stands as a testament to the nuanced but less frequent exploration of sensory and emotional lexicon in English, indicating

differing cultural emphases on the sensory experiences and their linguistic representation. Through these linguistic developments, Chinese not only maps the sensory world onto emotional experiences but also enriches the dialogue around human perception, interweaving the tangible with the intangible to create a vibrant lexicon of modern life.

Moreover, scale (Type 2), reflects the dynamic interplay between literal dimensions and their metaphorical extensions within the Chinese lexicon, introducing terms that navigate the spectrum from tangible magnitude to abstract notions of scale:

Navigating Dimensions: The advent of terms like "人工智能大模型" (large-scale AI models) and "大数据" (big data) in Chinese discourse mirrors the technological zeitgeist, where "large scale" denotes not only the vastness of data and complexity but also the expansive potential of technological innovation. Conversely, "small scale" in words "小康" (moderate prosperity) articulates aspirations ranging from creative liberty to societal well-being, encapsulating the shift from physical measurements to expansive conceptual realms. Similarly, the phrase "小目标" (small goals), while modest in wording, signifies a strategic approach to achieving broader ambitions, highlighting the nuanced interplay between scale and intention.

In contrast, the past decade has witnessed a more restrained exploration of spatial scale in English and Russian, with terms like *"перепись"* (census) subtly hinting at magnitude through prefixes that suggest expansiveness or comprehensive scope. This relative paucity of scale-oriented buzzwords points to differing cultural and linguistic emphases on the concept of scale and its representation.

Viewed through this lens, Type 2 (Scale) not only enhances the linguistic fabric by intertwining the physical with the metaphorical but also provides insights into the diverse cultural narratives that engage with the concept of scale.

2.2.4 Cultural and philosophical differences in social phenomena

Cognitive linguistics showcases its capacity to reflect cultural variations (Palmer, 1999), while the formation of imagery is shaped by cultural image-schemas (Sharifian, 2014). This indicates that the schemas and values rooted in culture play a significant role in shaping how individuals conceptualize visual imagery. Furthermore, the integration of spatial imagery with cultural values in language serves as a nuanced medium for articulating distinct cultural differences (Levinson, 1996). This perspective underscores the profound interconnectedness between linguistic expressions, spatial understanding, and cultural identity, emphasizing the crucial role of cognitive topology-imagery in exploring the nuances of cultural image-schemas. The investigation into cognitive topology, particularly focusing on spatial structures (type 3) as the essence of the Topology-Imagery Hypothesis, paves the way for scrutinizing cultural image-schemas and philosophical foundations across diverse cultures:

Russian Emphasis on Dichotomy. The Russian linguistic landscape is distinguished by a marked preference for illustrating oppositional dynamics, such as the process from inside to outside in topological pattern "container". This proclivity is vividly showcased through the regular use of prefixes like "анти-Х" (anti-X) and "де-Х" (de-X) in the Words of the Year, revealing a clear predilection for terms that convey contrast and negation. These lexical choices underscore a cultural narrative deeply entwined with notions of resistance, transformation, and opposition, enriching the discourse with complex structures of lexical meanings.

Chinese Emphasis on Integration and Harmony (季羡林, 1993). In stark contrast to dichotomous models, Chinese philosophical thought espouses a holistic and integrative outlook (type 3). This transformation can be seen as adding new elements to the traditional "container". The recurrent use of constructs like "新X" (new X) in Words of the Year serves as a prime example, signifying not just updates in language but a conscious endeavor to weave new concepts into the fabric of existing lexical structures. This promotes a narrative of continuous innovation and cohesive amalgamation. This linguistic tendency highlights a cultural valorization of balance, ongoing development, and the seamless integration of the old with the new. Moreover, in the wake of globalization, the adoption of the structure "去X" (remove X) in Chinese, denoting opposition or resistance to certain trends, showcases the language's flexible adaptability. It incorporates avenues for expressing dissent, all the while maintaining its intrinsic ethos of integration and harmony, thus broadening its narrative and expressive depth.

English Emphasis on Integration. The terms in English primarily showcase an emphasis on integration, reflecting a philosophical orientation towards melding diverse elements, as illustrated by constructs like "Deep-X" (type 3). These expressions suggest a sophisticated handling of conceptual relationships, emphasizing themes of depth and transformation. English linguistic developments tend to favor connectivity over division, indicating a cultural propensity for delving into the interconnectedness of concepts and the stratification of meanings.

This discussion enriches the comprehension of universal, yet distinct, strategies used in the cognitive processing of spatial imagery and lexical semantics across languages. Highlighting the crucial role of spatial structures and scenarios in semantic basic and metaphorical expressions, the study unveils the complex interplay between cognition, language, and culture. It introduces new pathways for investigating the dynamic relationship between spatial cognition and linguistic expression, providing deep insights into the cognitive mechanisms that underlie the understanding and utilization of language in varied cultural contexts.

Conclusion

This study successfully explores the distribution of different cognitive patterns underlying the relationship between metaphorical and basic meanings, with a specific focus on spatial imagery. The novelty of this research lies in analyzing the cognitive and perceptual information with metaphorical meanings from the perspective of topology-imagery, illuminating the pivotal role of spatial cognition in linguistic understanding. Through this study, the following conclusions were drawn:

1. The study conducted a thorough cognitive classification of the relationship between basic and metaphorical meanings. The findings reveal five types of cognitive and perceptual information, which constitute the core cognitive mechanisms in lexical semantic relationships. This classification of two types of topological patterns underpinning CPI highlights the significant role of spatial cognition in understanding linguistic semantics.

2. By cognitively annotating the Words of the Year in English, Chinese, and Russian over ten consecutive years, the study uncovered five types of cognitive or perceptual information within lexical semantics. Our findings suggest that Type 3 significantly contributes to the overall data variance and forms a distinct cluster, indicating its unique role in lexical semantics. Furthermore, the research identified structural relationships (Type 3) and scenarios (Type 4) as the most prevalent cognitive information within the lexical semantics of the three languages, underscoring the universality of spatial imagery in semantic cognition. However, the proportions vary across languages. English shows a higher proportion of Type 4, Russian has a higher proportion of Type 3, while Chinese stands out in Types 2 and 5. This distribution reflects cognitive preferences in semantic shifts specific to each language. Nevertheless, overall, there is no significant correlation between the three languages and cognitive classifications, suggesting that this cognitive classification has a certain degree of universality. Furthermore, two topological patterns, "container" and "line," align with human cognitive image-schematic mechanism and are effective means for understanding different types of information within lexical semantics.

Future research perspectives could delve deeper into the cognitive mechanisms underlying semantic relationships beyond basic and metaphorical meanings in various languages. Another potential direction is to investigate the impact of technological and social changes on the evolution of cognitive patterns in language. By addressing these areas, future studies can build on the foundational insights provided by this research, further advancing our understanding of the intricate relationship between spatial cognition and linguistic semantics.

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