Associative Experiments as a Tool to Construct Dictionary Entries

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Abstract

Associative experiments have been used in psychology and psycholinguistics for over a hundred years and have proven to be an efficient tool in identifying those components of a cognitive structure which are relevant for a contemporary language user and arranging them into a hierarchy. We argue that the findings obtained through such an experimental approach can serve as the basis for compiling a dictionary entry that reflects the language in use now and does not lag behind by failing to depict changes in the semantic structure of a word or modifications in its use. To demonstrate how it works we have considered a rather complex notion of *empire* and its representation in the linguistic consciousness of Russian and American English native speakers. Relying on the findings of the associative experiment held with 148 Americans and 434 Russians we suggest ways of drafting dictionary entries that would reflect those semantic components which are relevant for language users given the current political and economic environment.

Keywords: associative experiment, modelling cognitive structures, stimulus and reaction

1 Introduction

Among the most challenging tasks that a lexicographer faces is a requirement to compile dictionary entries that stand up to the current language use rather than reflect the language in use 20 or so years ago. One of the ways to achieve this is to build dictionary entries upon the study of the relevant semantic components of the word meaning embedded in the linguistic consciousness of native speakers. Relying on this analysis as the foundation for drafting a dictionary entry can be very helpful, as the findings of such research can reflect even minor changes in the semantic structure of a word, in its distribution and use, and in the most typical associations with a given word.

From this perspective an associative experiment can serve as an efficient tool to unveil how the word meaning manifests itself in the public and individual consciousness. It is a way to uncover and prioritize those components of cognitive structures that are embedded in the language and enjoy diverse ways of verbal representation. It can be argued that these findings prove very helpful when constructing conventional dictionary entries, as they can unveil those uses of a word that are engraved in the public consciousness yet are not featured as a word meaning component. Some prominent Russian psycholinguists (A.A. Zalevskaya (2011; 2014), V.A. Pishchalnikova (2002) and others) consider *word meaning as a cognitive structure* to denote these cognitive components outside the frame of conventional word meaning.

It is common practice to systemize the findings of associative experiments in associative dictionaries with entries that feature an assortment of reactions by a representative group of subjects, varying from the most frequent ones to unique ones (see a typical associative dictionary entry structure in Fig. 1).

Stimulus word	Associations
Power	absolute, agency 2, authority 4, awful, careful, company, control 3, cord 2, corporation, country, dark, discipline, dominate, drive, electricity 7, empire, energy, Federal Credit Union, frightening, gender, George Bush, girl, government, grip, help, hour, house, hungry 2, in charge, justice 2, king, knowledge 3, lift, light 2, man, me 3, mighty, money 4, motor, Nietzsche, on 2, oppression, outrage 3, people 2, plant 4, play 3, point 5, political, politics, President 3, rangers 2, red 2, speed, station, status, steadfast, strained, strength 18, strong 4, structure, struggle 8, Superman, super, supply, surge 4, to the people, tool, trip 2, truth, ultimate, unfair, violent, weakness 4, work, yes **149+75+49+1**
Legend: - the number next to associations shows the number of subjects who have provided this response (if there is no number, only one respondent provided this association); - the numbers at the bottom feature (1) the number of responses received, (2) the number of different associations, (3) the number of single associations, (4) the number of void responses.	

Figure 1: Typical structure of an associative dictionary entry
(the findings of the associative experiment with American subjects conducted by the author).

There are numerous examples of associative experiments conducted by Russian researchers that can serve as the basis for lexicographic work (Petrova 2008; Iashin 2009; Stepykin 2011; Panarina 2017, etc.). However, at presented there are few papers published outside Russia that focus on the findings of associative experiments, with examples being Deese (1965), Martinek (2009), and Ufimtseva (2014), among others.

When a lexicographer is challenged with a task of drafting a dictionary entry for a complex notion (such as *democracy, globalization, empire*, etc.), s/he is bound to consider the historic and the current geopolitical context. With that s/he risks being steered into an interpretation which is torn away from a user of the language by identifying and giving prominence to those semantic components that remain within the domain of political terminology. This results in a dictionary entry failing to mirror the representation of the notion in the linguistic consciousness of present day native speakers.

We argue that to compile a dictionary entry a researcher needs to consider those semantic components that make up the integral parts of the mental representation verbalized by this word. Such an approach is certain to help a definition and interpretation of any complex notion stand up to the criteria of relevance, and to reflect the current language use.

2   Research Objectives and Foundations

Our research focuses on the complex notion of *empire* which is engraved in the public consciousness of the population of any powerful, domineering state, including the USA, China, Russia and many more (these states are commonly dubbed superpowers). Given the current global political and economic environment, we considered those cognitive structures which are characteristic of the population of the USA and Russia.

Common sense suggests that any state that is characterized by a proactive position in global terms, that is involved in international affairs and to a large extent dictates domestic policies of other states, adopts a number of features of an empire. To ensure the best domestic and international performance

of such a superpower a certain effort is invested to promote these features through the mass media and political speeches (see examples 1-3 of American media texts, and examples 4-5 of Russian media texts).

(1) Fighting back tears, Bush vows that America will "**lead the world to victory**" over terrorism in a struggle he termed the first war of the 21st century. (www.september11news.com)

(2) At the center of the war's vast changes was the military – transformed by the nation into a colossus and, in turn, transforming the nation into a superpower. (*Time*, March 9, 1998)

(3) Whether it is a **fight** against fascism or communism, or even misconceived interventions like Vietnam, America's mission is **to further** not only its interests but also its **values**. And that idealism streak is the source of **its global influence**, even more than its **battleships.** (*Time*, April 13, 1998)

(4) Вести из стран СНГ как **вести с фронта. Потеряны** Грузия, Украина, Молдавия, Киргизия. Аджария **пала. Враги устраивают диверсии** в Узбекистане и Казахстане, **подбираются** к Белоруссии**.** Минск **держится,** но если он **падет**, страшно подумать, - открывается дорога на Москву. Что же за **война** идет на просторах СНГ? Кто, с кем и за что **воюет?** (*НГ*, 27.03.2006) [The news arriving from the CIS states is like the news from the combat zone. Georgia, Ukraine, Moldavia, Kirgizia are lost. Adzharia has fallen. The enemy is sabotaging Uzbekistan and Kazakhstan and is advancing on Belarus. Minsk is holding ground, yet if it surrenders, Moscow will remain unguarded. What war is sweeping the CIS states? Who is combating who? And why?]

(5) Глава МИД РФ Сергей Лавров в интервью радиостанции «Эхо Москвы» **подверг** Тегеран **беспрецедентно жесткой критике**. Более того, российский министр дал понять, что Россия **поддержит предложение передать ядерное досье** Ирана в Совбез ООН – хотя до сих пор Москва никогда **не одобряла такого шага.** (*Коммерсантъ*, 13.01.2006) [In his interview to "Ekho Moscvy" Sergey Lavrov, head of the RF Ministry of Foreign Affairs, lashed Teheran. Moreover, the minister suggested that Russia would support handing over Iran's nuclear development profile to the UN Security Council despite the fact that Russia's government never before supported such measures.]

It is vital to convey the positive image of the empire and establish strong links between the components of the corresponding cognitive structure and the current policies of the superpower. Yet it takes additional effort, as it is at odds with the democratic values which have been adopted and promoted by these states. The detailed analysis of the media texts featured in a number of mainstream Russian and American newspapers and magazines over the past 20 years suggests that the mass media are establishing and maintaining these links by making the features of an empire explicit in contexts relating to the current domestic and international affairs (some of the examples are listed above). It results in the transformation of the cognitive structure of the notion of empire embedded in the public consciousness of the present-day population of both states. Without going any further into the details of this analysis (as it remains outside the scope of this paper) we would like to focus on the changes in the cognitive structure which become apparent when we compare the dictionary entry for empire which reflects the conventional interpretation and use of the notion, and the findings of the associative experiment with American English and Russian native speakers.

3   Componential Analysis Findings

At the initial stage of the research we studied different dictionary entries to compile a list of relevant semantic components of the word *empire*. To do this we relied on the *Dictionary of Contemporary*

Russian Literary Language (1956-65), *Dictionary of the Russian Language* edited by A.P. Evgenye-va (1999), *Oxford English Dictionary* (1989), *Webster's New World Dictionary* (1991), *Macmillan's English Dictionary* (2000), *Webster's New College Dictionary* (1995), *Political Encyclopedia* (1999), *Historical and Etymological Dictionary of Contemporary Russian Language* (Chernykh 2003), Glossary.ru: Dictionaries for Social Sciences (www.glossary.ru), and *Dictionary of Foreign Words* (Krysin 2000). Listed below are some examples of dictionary entries:

(1) Империя – исторически преходящая форма государства, характеризующаяся обширной, но не обязательно целостной территорией, многонациональным составом населения, централизованным (монархическим) управлением, стремлением к политическому и силовому господству в мировом масштабе (*Political Encyclopedia* 1999: I, 429) [Empire – a historically transient form of state characterized by a vast, still not necessary single territory, multiethnic population, centralized power (monarchy), aspiring to exercise political and military control globally].

(2) Империя – 1. Монархическое государство, во главе которого стоит император (Империя Карла Великого). 2. Крупная империалистическая держава (Британская империя) (*Dictionary of the Russian Language* edited by A.P. Evgenyeva 1999: I, 662) [Empire – 1. A monarchical state reigned by an emperor (i.e. Empire of Charles the Great. 2. A large imperialistic state (the British Empire)].

(3) Empire – 1. Imperial rule or dignity. 1). Supreme or extensive political dominion, esp. that exercised by an emperor or by a sovereign state over its dependencies. 2). Paramount influence, absolute sway, supreme command or control. 3). The dignity or position of an emperor, the reign of an emperor. 2. That which is subject to imperial rule. 1). An extensive territory (esp. an aggregate of many separate states) under the sway of an emperor or supreme ruler, also, an aggregate of subject territories ruled over by a sovereign state (*Oxford English Dictionary* 1989: V, 187).

(4) Empire – 1. Supreme rule, absolute power or authority. 2a. Government by an emperor or empress. 2b. The period during which the government prevails. 3a. A group of states or territories under the sovereign power or an emperor or empress. 3b. A state uniting many territories and under a single sovereign power. 4. An extensive social or economic organization under the control of a single person, family or corporation (*Webster's New World Dictionary* 1991: 445).

As a result of the componential analysis we made up two lists of the relevant semantic components for the word *empire* (for the Russian and English languages). These lists included those content words (naturally the function words were not considered) which were repeatedly used by lexicographers in different dictionaries, hyponyms were then replaced with superordinate terms (such as 'emperor' / 'empress' / 'sovereign' with 'monarch'), words identical or nearly identical in meaning
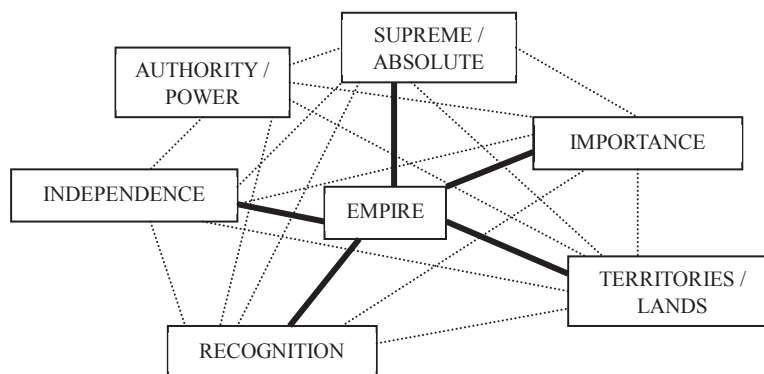

Figure 2: Relevant semantic components of the word *empire* (in the English language).

were separated by a slash (such as 'supreme' / 'absolute'). We referred to these semantic components as *relevant* because statistically they were most commonly attributed to an empire. By employing many and diverse lexicographic sources we attempted to make the list as complete and comprehensive as possible. These lists were similar yet not identical for the Russian and English languages. The findings of this stage of our research are featured in Figures 2-3. These lists of the relevant semantic components served as the reference point for our further study.
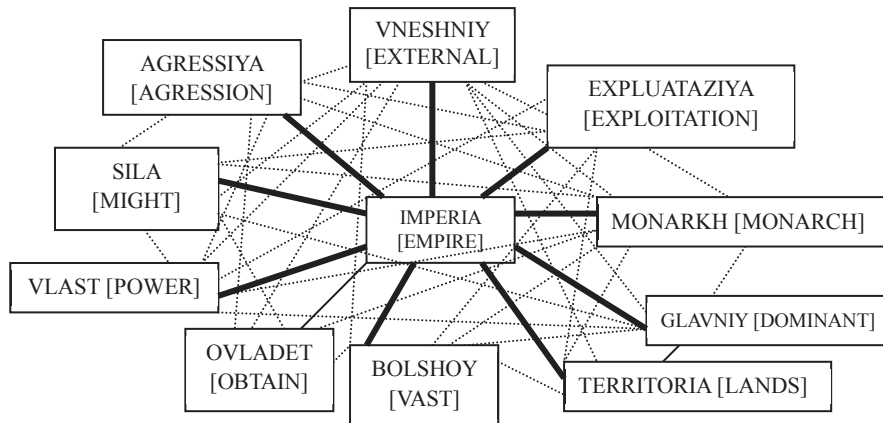

Figure 3: Relevant semantic components of the word *empire* (in the Russian language).

4   Associative Experiment Findings

We then proceeded to the associative experiment with 434 Russians and 148 Americans (both groups of subjects involved people in three age ranges (under 25, 25 to 45 and over 45) and were balanced in terms of gender to make them representative).

Table 1: Number of subjects in each cluster.

Citizenship	Russian			American		
Age span	<25	25-40	>40	<25	25-40	>40
Number of subjects	139	138	157	48	63	37

4.1   Procedure and Materials Used

The subjects were offered a questionnaire featuring a list of stimulus words (involving all the items identified at the initial stage of the research) and distracters (random words which prevent associative linking when a subject fulfills the task). The task said that the subject was expected to write down any word or collocation which flashes through his/her mind on reading the stimulus word (only the first association was to be put down). The subjects were asked to complete the task within a very tight timeframe which was calculated by allocating about seven seconds to put down an association for each stimulus word (the timing slightly differed for American and Russian subjects as the number of stimulus words was different, but in both cases it was under five minutes).

4.2   Verified Hypotheses

The associative experiment was designed to verify the following hypotheses (in propounding the hypotheses we relied on the findings of the componential analysis and the analysis of the media texts

featured in a number of Russian and American mainstream newspapers and magazines over the past 20 years).

1. As the democratic values supported and promoted internationally prevent the mass media from establishing direct links between a superpower and empire, the word *empire* is never used in describing the current domestic and international activity of the state. Yet media and political texts do verbalize an associative link with the relevant components of the corresponding cognitive structure. Thus the first hypothesis implies that the link between the cognitive structure and the term *empire* is deteriorating. This means that the number of associations between stimulus words denoting different components of the cognitive structure and the word *empire* is unlikely to be high.
2. It can be assumed that the hierarchy of the relevant components of this cognitive structure is being reconsidered, with new elements becoming central to the structure and replacing empire as the integral component. This implies that some stimulus words are likely to prompt more diverse and multiple associations than others (including the stimulus word *empire*).
3. As American newspapers and magazines promote the positive image of empire by drawing links between this cognitive structure and fundamentally religious concepts (such as messiah, apocalypse, antichrist, etc.), we can suggest that the overall sentiment with the US population is rather positive. The US mass media seem to have implanted a positive image of empire in the public consciousness, and are efficiently promoting it further. This means that we should expect more associations reflecting the positive appraisal of empire in the responses of the American subjects than that in the responses of the Russian subjects.

4.3   Analysis and Interpretation of the Experimental Data

Initially the reactions to the stimuli featured in the associative experiment were classified into clusters joining together words and collocations with similar or identical meanings. Step two related to calculating the frequency of each cluster of associations and on the basis of their frequency arranging them into a hierarchy to construct a model of the cognitive structure represented by the word *empire* as featured in the public consciousness of contemporary Russian and American English native speakers (the most frequent responses have been placed at the top of this hierarchy, and are referred to as relevant components of the cognitive structure in the text to follow).

The most frequent associations to the stimulus word *empire* included *State Building 15*, *state 11*, *strikes back 8*, *Rome 7* (the figures name the number of English-speaking subjects having provided these responses) among them superordinate terms (*state*), historic notions (*Rome*), realia (*[Empire] State Building*) and allusions (*strikes back* – an allusion to the *Star Wars* series of films). The relevant components of the cognitive structure for Russian native speakers were represented by the following associations *power 51, of evil 36, state 33, great 17, Roman 16, country 16, vast 14, Russia 14, Russian 12, emperor 11, Rome 11, evil 10, might 10, tsar 10, crown 9, powerful 9, of passion 9, sovereign state 7, very large 7, of feelings 6*. In terms of content these are superordinate terms (*state, country*), characterizing adjectives (*very large, powerful*), historic notions (*Rome, Roman, Russian*), and set collocations (*empire of evil*), to name just a few. Similarly, we worked through pools of associations to every stimulus word.

The findings of the experiment were contrasted with the initial model of the word meaning, and we discovered that some of the key semantic components tend to fade away in the public consciousness, giving way to some of the peripheral ones. For instance, when analyzing the responses of the Russian subjects we observed that the association *empire* turned out to be very rare: *monarch – empire* (eight instances), *of the empire* (three instances); *power – empire* (two instances). At the same time some peripheral components of the cognitive structure showed strong bilateral links: *power – might,*

power – monarch, obtain – might, monarch – power, monarch – dominant, exploitation – might, lands – vast. The association *might* appeared to have links with most relevant components of the cognitive structure, which implies that it is gaining momentum and taking over the dominant position in the hierarchy. These findings clearly demonstrate that the cognitive structure denoted by the word *empire* is undergoing a structural change, and suggest that the term *empire* is becoming torn away from its mental representation. These changes are featured in Figure 4 (two-way arrows demonstrate bilateral associative links, one-way arrows show that the link is unilateral and rather unstable).
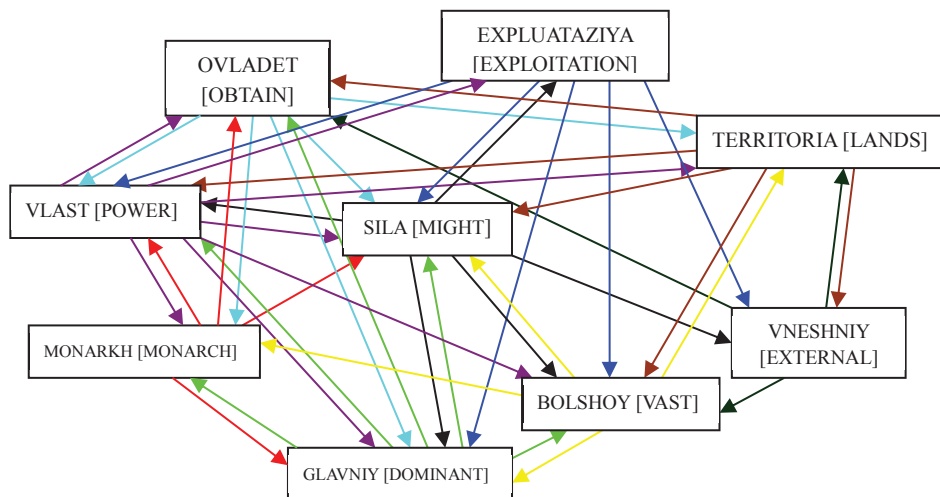

Figure 4. Changes in the hierarchy of the relevant components of the cognitive structure denoted by the word *empire* (in the public consciousness of Russian native speakers).

The data obtained from American English native speakers turned out to be less consistent. The most apparent link was established between power and might (stimulus: *power* – associations: *outrage, oppression, strength, strong, struggle, surge, violent* (26% of all responses), stimulus: *might* – associations: *power* (22.6% of all responses). The analysis of the experimental data suggests that the links between other components of the cognitive structure represented by the term *empire* are mediated by these two components (*might* and *power*) as they feature as associations for nearly every stimulus word: *recognition – power; supreme – power; importance –might; territory – power; independence – power + might*. Judging by these findings both *power* and *might* are pushing their way to the center of the cognitive structure, though it remains unclear whether the other components are adopting new roles within the cognitive structure or not (we refrained from drafting a figure in this case as the structure is not transparent).

Overall *might* turned out to be very frequent in the associations of the American subjects with its frequency in responses of the Russian speakers far behind (18% for American English native speakers vs. 8.4% for Russian native speakers). We thus consider this component to be the integral element of the cognitive structure represented by the word *empire* in the public consciousness of the US population. At the same time it is certainly gaining momentum in the corresponding cognitive structure of Russian native speakers, with the trend quite apparent.

Another finding related to the fact that there appears to be a very vague link between the initial definition of *empire* as a powerful economically and politically developed state that enjoys dominion over other territories and is commonly reigned by a sovereign, and the word *empire* which routinely pops up in collocations like *the evil empire, Empire State Building, business empire* and other examples. These associations signal that the word *empire* is losing its link with the historic concept.

In the responses of the Russian subjects there were 32% of associations that pertain to the definition of the term (including *power, vast, emperor (monarch), might* and superordinate terms *state, country*). Accordingly, in the responses of the American subjects there were 20% of associations that reflect relevant semantic components (including *big, large, vast, great, dictator, emperor, king, royalty, crown, government, reign, rule, power, powerful, dominant, kingdom, realm, dominion*). The majority of associations, however, were not linked to the definition of the term as featured in conventional dictionaries.

We have also attempted to verify a hypothesis that, despite the fact that the mass media aim to support the positive image of the state and relate to the mental representation of empire on a day-to-day basis (though latently), it is nonetheless negatively appraised by the population of Russia, while the American mass media seem to be quite successful in promoting the positive appraisal of empire. Yet there were very few associations that fall into this category: positive appraisal in 0.2% of responses vs. negative appraisal in 12% of responses (for Russian native speakers), and positive appraisal in 2% of responses vs. negative appraisal in 2% of responses (for American subjects). Thus we cannot consider this hypothesis confirmed or disproved.

Yet another finding became apparent when we contrasted different age groups. It appeared that the Russian subjects aged between 25 and 40 frame considerably fewer associations that relate to the relevant semantic components of the word *empire* than other age groups (25% vs. 34% by the subjects aged under 25 and 35% by the subjects aged over 40). From our perspective, this can be accounted for by the environment in which these people were raised: they were children and young adults at the time of *perestroika* (mid-80s) and can adapt well to the new realia and corresponding changes in certain cognitive structures.

When contrasting the data obtained from the American and Russian subjects, we observed that Americans suggested fewer relevant semantic components than their Russian counterparts, with the most obvious discrepancies in the age group "under 25". It is apparent that these discrepancies stem from evident differences in the social and political environments of these two countries.

Relying on the analysis and interpretation of the experimental data we have managed to confirm the first two hypotheses. However, the third hypothesis needs further research and cannot be either confirmed or disproved as of today, and perhaps it requires a different experimental method or larger groups or subjects.

5   Conclusions

This paper presents just some of the findings which could be employed in lexicographic work to extend and specify the dictionary entry of the word *empire*. Though associative meaning is sometimes seen as beyond the scope of dictionary-making practices, we argue that associative experiments can be an efficient tool in lexicography.

In the final analysis, the findings of the associative experiment carried out with Russian and American English native speakers helped reveal the relevant semantic components of the word meaning which are embedded in the linguistic consciousness of contemporary native speakers. It was revealed that empire is no longer viewed in its conventional meaning as a form of state. Instead, it is commonly seen as a policy implying a proactive position in global terms, involvement in various international affairs and exerting influence. This change in the hierarchy of the relevant components of the mental representation of empire opens loopholes for those states which exercise control and adopt domineering positions as it salves negative sentiment and helps promote such a policy.

Moreover, the associative experiment demonstrated that the number and type of the relevant components of this cognitive structure are culture-determined, with American and Russian subjects suggesting contrasting associations. The universal trend is for the term *empire* to become torn away from its mental representation, yet this process is more apparent with Americans.

These findings are a helpful resource for lexicographers, as they reflect those semantic and associative components which are relevant for language users given the current political and economic environment.

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