

**PERAET 2021****International Scientific Conference «PERISHABLE AND ETERNAL: Mythologies and Social Technologies of Digital Civilization-2021»****BILINGUALISM AND MODERN ELECTRONIC RESOURCES**

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**Abstract**

In this article, human thinking is subject to research within the framework of the topic of bilingualism / bidialectalism and modern electronic resources that contribute to the study of this topic. Special electronic resources can help to research bilingual processes by using tasks of American scientist, psychologist John Ridley Stroop and others. The object of study is the language situation in Brussels. The corpus of examples consists of phraseological units of the Brussels variant of French. The Brussels variant of the French language is a bright example of linguistic interaction in the Belgian capital Brussels, where Franco-Dutch language contacts are conditioned by historical processes, and their integration with English as Lingo-Franca is due to the processes of globalization. There is a variation between the repertoire of phraseological units components combinations of Brussels French and standard French which made a problem of using one or the other component in bilingual brain.

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## 1. Introduction

There have been many studies which support the idea that people who use two or more languages every day reap significant benefits. "Exercising the brain to use a different language based on context and speaker improves attention and memory skills, as well as better recovery from stroke and even later onset of dementia symptoms" (Katsos, 2016, para 1). But there is another source of brain training in language use: dialects. Bilingualism "is used to denote the simultaneous knowledge of two languages at a high level, sufficient for life in the environment of natural speakers, learning on them, etc." (Gurova, 2018, p.157). Bidialectalism, which simply means the systematic use of two different dialects of the same language, is widespread in many parts of the world. According to "Mashanable" magazine "People who speak 2 dialects share a cognitive advantage with bilingual people, may share a common cognitive profile with bilingual speakers" (Katsos, 2016, para.1). "...Cognitive benefits from bilingualism range from none to substantial as a function of age, type of bilingualism (e.g., life-long balanced vs later-onset or infrequent use of the other language), syntactic relation between the two languages, socio-economic and immigrant status, task, and laboratory" (Valian, 2014, p. 3).

In this article, the study of the specifics of human thinking is presented locally, where the regional and standard languages are spoken, in Brussels, the capital of Belgium, in the region of the collision of two peoples with different mentality: Germanic and Romance who are looking for a compromise, a balance for coexistence as follows: the dissimilarity of cultures → awareness of this dissimilarity → an attempt to find the "coefficient of understanding of another culture" → "coefficient of understanding" = a special kind of national thinking in the language. Brussels consider themselves not quite Flemish and not quite Walloon. They say the same about the language they use in speech - not quite Flemish and not quite French. It is because of the difference from Dutch (including Flemish) and French (including Walloon) that the language of the Belgian capital is sometimes called "Brussels". However, this name is ambiguous, since in reality we are talking about two different languages at different levels of confusion - the language of Flemish predominance (**de brusseleer**) and the language of French predominance (**le bruxellois**). The Belgian linguist Hugo Baetens Beardsmore in his study "Les contacts des langues à Bruxelles, Le français hors de France" drew attention to the fact that the percentage of Brussels residents who speak two languages (Dutch and French) is more than 50%. - 11 communes, cities out of 19, the remaining 8 communes are Dutch-speaking (Baetens Beardsmore, 1971, pp. 223-247).

Many studies have proven that systematic switching between any two forms of language gives the mind additional stimulation. Examples of such transitions in the modern speech of Brussels are demonstrated in the work of the British sociolinguist Treffers-Daller (1993): *Je suis au balcon op mijn gemakke zo en train de regarder les étoiles* - I am on the balcony so that it would be easier for me to look at the stars (p. 27).

To the question of code switching in Brussels speech, the answer of the polled Brussels-born Gust, published in the book by Treffers-Daller (1993), is revealing: "Als ze Vlaams en Frans mengen, dat zijn, dat zijn ... pour moi ce sont des illettrés. Ce sont des gens qui ne connaissent ni le français parfaitement, ni le flamand parfaitement. Ils melent les deux. Ils font un mélange" - "If they (approx. Flemish and Francophones) mix Flemish with French, then they, then they ..., for me they are illiterate.

These are people who do not know fluently either French or Flemish. They mix both of them. They are mixing" (Treffers-Daller, 1993, p.74).

On the self-assessment scale of this respondent, information about his high level of knowledge of French and Dutch and a fairly good knowledge of Flemish is indicated. Nevertheless, this example shows that the respondent, without noticing it, makes a transition from Dutch to French in his speech, i.e. mixing occurs unconsciously (unconsciously). "Involuntary mixing or switching is caused by an impairment in bilingual language control, the set of functions necessary to use more than one language effectively...". "Although mixing and switching is frequently observed in all bilinguals, it becomes «a pathological behavior when it is inappropriately used within a context where speakers do not share both language codes..." (Mooijman et al., 2021, p. 1).

"But most of the time, bilinguals make use of just one language, for example when writing, listening to the radio, or having many conversations. In such (one-language) contexts, we might naturally assume that they activate the relevant (target) language but not the irrelevant language" (Costa et al., 2017, p. 1629). "Traditional research in bilingualism has consistently found that switching languages is effortful, placing demands on neural systems of cognitive control" (Blanco-Elorrieta, 2018, p. 1117). But recent works show that, "in fact, when bilinguals switch languages voluntarily, both the behavioral cost of switching and the associated recruitment of cognitive control areas are greatly reduced or completely eliminated. This suggests that switching languages is not inherently effortful, but rather, particular communicative demands may make it costly" (Blanco-Elorrieta, 2018, p. 1117).

## **2. Problem Statement**

Current trends indicate the need to analyze the mechanisms and methods of studying the work of the brain in bilingualism and digitalization. In this regard, it is relevant to refer to the phraseological fund. The issues of the formation of stable combinations are one of the most discussed in modern lexicology and cognitive science, since phraseological units reflect not only the specifics of the perception of the world by native speakers of a particular language, but also the peculiarities of human thinking, its metaphoricality and flexibility.

## **3. Research Questions**

The main issues of this study include the following:

- How does the brain work in the context of bilingualism and digitalization?
- What transformation mechanisms are involved in the formation of new phraseological units?

"In the last decade, digital technologies have also developed alongside advances in artificial intelligence and big data analytics" (Li & Lan, 2021, p.1). The modern resource BrainApps presents several interesting and effective game simulators. They were developed by a team of qualified specialists, therefore they have a user-friendly interface, beautiful and original design and, undoubtedly, will have a positive effect on cognitive processes in the human brain.

There are two simulators on the site:

- Stroop's task. With the help of the keyboard, during the passage of the game, a person chooses the color in which the word is written on the screen. This simulator is a modification of the standard Stroop effect test.
- Stroop's mission is revolution. The classic version of the game, which, however, has a slightly modified form: the trainee is given two cards, one has the same color of letters, and the meaning of the word, but the other does not. You need to choose the second option. In order to try to play, you can go to the appropriate section.

In psychology, the Stroop effect is called a delay in the reaction when reading words, when the color of the words does not match the written words (for example, the word "red" is written in blue).

Just a few weeks of an interesting game, and the user will feel an increase in the level of concentration, ability to work and resistance to external stimuli, and most importantly, there will be a noticeable improvement in the quality of work, especially if it is associated with mental work.

With the help of the Stroop effect, he proved that different parts of the brain are responsible for certain types of perception, so it becomes difficult to read the text. One area perceives the word itself (and in the older generation it is more active), and the second catches color much more slowly. In children, the areas responsible for the perception of the text are less pronounced, which makes the task much easier for them. In addition, the effect shows how quickly and efficiently a person adapts. After just a few minutes of continuous reading of such words, the brain automatically turns off the perception of the word and leaves only the understanding of color. It has been proven that bilinguals are the fastest in doing this task (faster than monolinguals). Based on the results, it was suggested that bilingual people are better at coping with tasks related to inhibition of reaction and change of attitudes.

The first appearance of the Stroop problem in the world occurred in 1935. Its developer is J.R. Stroop, who proved his assumptions experimentally.

Developments of such a theory appeared back in 1929, but they became widely known, and then 1935 is considered the year of the appearance of the effect.

To obtain the results, Stroop conducted several similar experiments. In the first experiment, a group of subjects had to name a word written on paper, regardless of the color in which it was depicted. In the second test, people had to name the color of the word, regardless of its meaning, and the third experiment involved naming the color of the square in which the word was written in black ink. During these tests, Stroop closely observed how theory prevails over practice, as well as how gradually people get used to the requirements and practical skills begin to dominate.

An interesting fact is that in Stroop test it turned out to be as easy to name the colors of the squares with the words written in them, as it is to voice the words, regardless of the color with which they are applied on the paper. That is why it is the second experiment that is used as the basis of the Stroop effect and as a training.

Stroop in lexicology. Example. Two possible markings (dog | chien) for one simple concept. They are both active and create conflict. You see a stimulus - an impulse and you immediately come up with two possible responses, and the task requires you to give one of them and ignore the other. "Bilingual mental lexicon is fundamentally permeable across language boundaries" (Van Hell, 2021, p.1).

What happens in the bilingual brain? The repertoire of combinations is limited by the code of the given language. The code imposes restrictions on possible combinations with other combinations. When faced with certain words, the brain assumes that they belong to a code, and in order to understand a word, you need to know the meaning ascribed to it in the lexical code of the language. Those. to be bilingual means to be constantly in the Stroop test. "Numerous studies are currently underway demonstrating that when bilingualism meets words in one language, activation goes through both languages" (Schwartz & Tarin, 2016, p.1).

Based on the results of the Stroop task, as well as the flanking task (Costa et al., 2009) and others it has been suggested that "bilingual people are better able to cope with the tasks of inhibiting reaction and changing attitudes" (Hui Ooi et al., 2018, p.867).

#### 4. Purpose of the Study

The purpose of this study is to show how brain works in bilingualism and digitalization and identify the mechanisms of transformations of the phraseological units in Brussels variant of French. Brussels phraseological units was compared with identical French phraseological units on the component level. Such comparisons will help to show how changes go in bilingual brain.

#### 5. Research Methods

The research methodology is based on the use of: 1) the component method; 2) the comparative method.

#### 6. Findings

"When individuals know two or more languages variation in the onset and extent of exposure to each language typically results in a functional imbalance..." (Bradlow, 2021, p.1). A bilingual (bidialect) is constantly faced with the choice of one or another of phraseological utterance, having a dialect and normative one in mind. This is how phraseological variability arises. Making assumptions about the development lexical items, we can say, that its will be "at different acquisition stages over time, displaying different kinds of configurations and different degrees of automatization in their processing" (Ecke & Christopher, 2021, p. 1).

Its possible combinations in the Brussels version of the French language: (lexico-semantic, quantitative (with an equivalent meaning), grammatical, lexico-syntactic, combined, connotative, morphological, quantitative (with semantic derivation), morphonological, graphic).

At the component level:

- component is a synonymous variant:

Brus.Fr. "Faire **la file**" (Stand. Fr. "Faire **la queue**") - to stand in a queue;

- component is a variant from the general lexico-semantic group:

Brus.Fr. "Monter aux **barricades**" (Stand. Fr. "Monter au **créneau**") - to defend their positions, beliefs, to join the fight (LSG "fencing");

- component is a variant from another lexical-semantic group (semantically uncorrelated component):  
Brus. Fr. "C'est **chou** vert et vert **chou**" (Stand. Fr. "C'est **bonnet** blanc et blanc **bonnet**", "c'est jus vert et vert jus") - everything is the same, that in the forehead, that forehead. (LSG "floralism" / LSG "foodstuffs");
- component is a metonymous variant:  
Brus. Fr. "Pousser à la **charrette**" (Stand. Fr. "Pousser à la **roue**") - to help in something, to press, to give the heat;
- components with archaic semantics:  
Brus. Fr. Pour une **pièce** de pain (Stand. Fr. pour un **morceau** de pain) - for a piece of bread, for next to nothing;
- components is an archaism:  
Brus. Fr. "**Bouter** le feu" (Stand. Fr. **mettre** le feu) - 1) set fire, set fire; 2) cause confusion, upset;
- components are quantitative variants with equivalent value - added variants:  
Brus. Fr. "Faire **du** cas de qn, de qch" (Stand. Fr. "Faire cas de qn, de qch") - to value, appreciate, attach importance;
- components are eliminated variants:  
Brus. Fr. "Être en position" (Stand. Fr. "Être en position **intéressante**") - to wait for the birth of the child;
- components are quantitative variants with semantic derivation (additional concretizers and intensifiers lexemes):  
Brus. Fr. "Faire **toujours** le gugusse" (Stand. Fr. "Faire le gugusse") - (always) to play a fool, a clown;
- component is a associative variant:  
Brus. Fr. "Envoyer à la **moutarde**" (Stand. Fr. "Envoyer au **bain** / au **diable**") - to wait for the birth of a child;
- components are grammatical variants: component is a variant preposition:  
Brus. Fr. "En avoir **jusqu'au-dessus de** la tête" (Stand. Fr. "En avoir **par-dessus** la tête") - to be fed up with something;
- component is a variant article:  
Brus. Fr. "Faire pour **un** mieux" (Stand. Fr. "Faire pour **le** mieux") - to do what is best;
- component is a variant category of a number:  
Brus. Fr. "Apprendre **une belle**" (Stand. Fr. "apprendre **des belles**") - to learn something amazing that catches by surprise;
- component is a morphological variant:  
Brus. Fr. "Taper la **carte**" (Stand. Fr. "Taper la **carton**") - (fam.) To play cards;
- components is a lexico-syntactic variants: component verb - categorical variant: Brus. Fr. state verbs ← Stand. Fr. action verbs:  
Brus. Fr. "Avoir le temps long" (Stand. Fr. "trouver le temps long") - to be bored;

- component is a variant of preposition:

Brus.Fr. "En avoir **jusqu'au-dessus de** la tête" (Stand. Fr.. "En avoir **par-dessus** la tête") - to be fed up with something;

- component is a preposition de (conveys a possessive meaning):

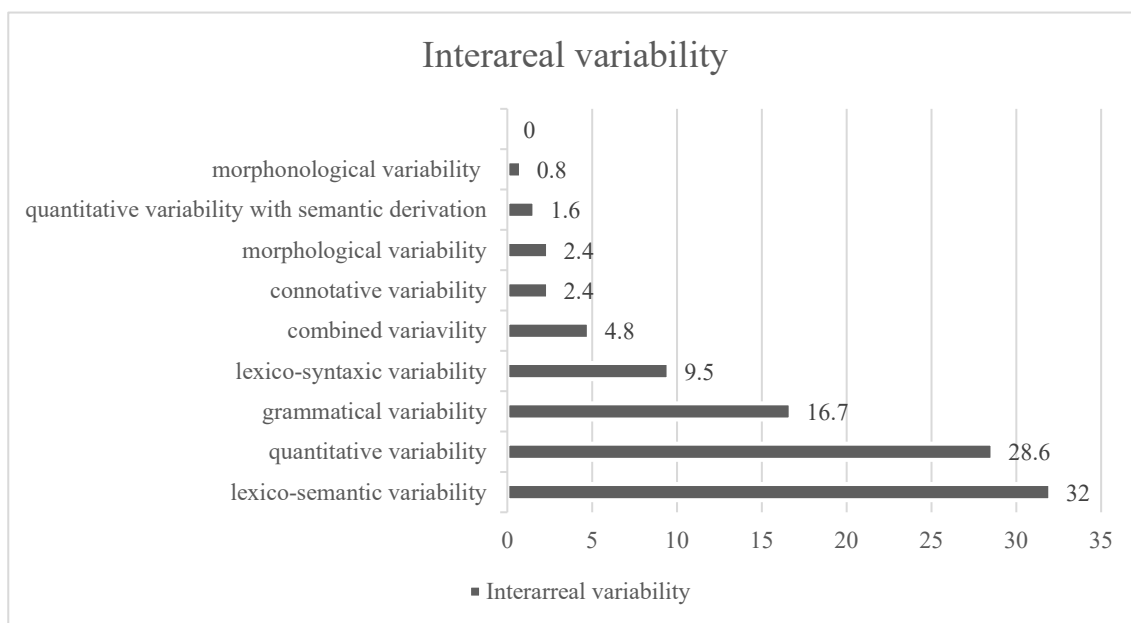
Brus. Fr. "Beurre **de ferme**" (Stand. Fr. Beurre **fermier**) - butter based on sour cream from uncooked milk, produced by a dairy farmer;

- components are graphical variants:

- Brus. Fr. "À l'**escavèche**" (Stand. Fr. "À l'**escabèche**") - refers to fish cooked in this way, i.e. marinated fish; "Pickled fish"; fourteen).

## 7. Conclusion

As can be seen from Figure 1, the lexico-semantic, quantitative (with an equivalent meaning) and grammatical types of variability prevail in the percentage ratio.



**Figure 1.** Interareal variability

1) Lexico-semantic variability - 32%. Of these, this type of variability was made up of the following processes:

- variability of components from different lexical and semantic groups - 17.5%;
- variability of components from the general lexico-semantic group - 6.3%;
- variability of synonymous components - 4%;
- variability of metonymic components - 3.2%;
- variability of components with archaic semantics - 0.8%;
- variability of components - archaisms - 0.8%.

2) Quantitative type of variability with an equivalent value - 28.6%. Of these, this type of variability included such processes as:

- components are eliminated variants - 23%;
- components are added variants - 5.6%.

3) Grammatical variability - 16.7%. Of these, the following processes are included in this type of variability:

- variant preposition - 17.6%
- variant number category - 2.4%
- variant article - 2.4%
- variant pronouns - 1.6%
- variant adverbs - 0.8%.

Thus, the interareal variability of components has many mechanisms of transformation. It participates in formation of locally marked semantic variants at the regional level and create in the brain of bilinguals a problem of choice of the different combinations.

Modern electronic resources allow to explore the features of human thinking, including bilingual thinking. Bilingualism in Belgium has strengthened quite strongly. We can see many examples of language interaction at the phraseological level.

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