

WORD ASSOCIATIONS AND BINOMIALS¹

Petranka Ivanova

Abstract: *There are presented some thoughts about binomials and their importance as related to word associations is emphasized. Firstly, five words in the food domain used as stimuli are examined while searching to outline the association field of each and highlighting the dominant associations. Secondly, these same stimuli are added a conjunction to boost production of binomial pairs. These goals are achieved by means of questionnaires, in Bulgarian and in English, spread among some Bulgarian students studying English, Bulgarians living in the UK, and a small number of native speakers. The methods used are similar to Free association test and Word associate format. The results from the surveys and a comparison between the two languages serve as a basis for drawing conclusions on the preferences of the suggested options. The findings in two corpora confirm the observations.*

Key words: *word association, binomial, Bulgarian, English*

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1. Introduction

The idea about relying on data from a word association test in education is not new. This technique helps to build understanding about association fields of different words and according to some authors (Pehlivanova, 2003) it could be used as a means of semantization of new vocabulary in foreign language teaching. Also, it could be used for assessing vocabulary knowledge (Fitzpatrick and Thwaites, 2020: 4). The important role that it has in education is explicitly revealed by the words that „Associative retrieval, both as an aspect of lexical knowledge and as a means of investigating automaticity, has direct relevance to our understanding of language acquisition and processing...” (ibid.)

On the other hand, the presence of binomials in natives' speech is neither surprising, nor to be neglected. This makes it relevant to unify the two issues using the word association test as a tool to unfold the picture of the association field the way and the extent to which it touches the binomial domain.

1.1. Aims and objectives

The main goal that is set is to find out whether the association field of some stimulus words, both in Bulgarian and in English, consists of words that appear to be the second conjunct of particular binomials where the first conjunct is the stimulus word itself. As the results from the research are intended to be applied in foreign language teaching, it would be useful to know:

a) If the association field of a particular word in the foreign language is more or less the same, or completely different from the one in the native language;

b) If the presence of a conjunction accompanying the stimulus word makes any difference in outlining the association field.

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In order to come to any conclusions concerning a), a questionnaire of Type I was created in Bulgarian and in English. In its form it is close to Free association tests where the informants are given a stimulus word and they are expected to give the first word that comes to mind as a response. For the purpose of b), in search of typical binomial pairs, another questionnaire (Type II) was created. This time the respondents are suggested three options to choose among and the aim is to establish the binomials that prove to be typical among the informants. In this respect, it is of a rather controlled type which is close to Word associates format which Fitzpatrick and Thwaites (2020: 14 -15) describe as a research tool that “does not ask for words to be produced, but rather for connections between words to be identified”.

Finally, two corpora are used to compare with the findings so far. Brigham Young University-British National Corpus (BYU-BNC) provides evidence for the words in English, and Bulgarian National Corpus (BNC) serves the same purpose in Bulgarian.

1.2. Stimulus words

As word associations are often related to the list of Kent and Rosanoff where 100 words are arranged so that any relation between two words one after another to be avoided, the circumstance that the chosen words are semantically close together with the fact that the number of stimuli is much smaller make the present experiment significantly different. Despite these discrepancies, there is a characteristic that they both share. It is the fact that respondents are expected to react to a stimulus word with the first word that comes to mind.

Among the three main problematic areas for the success of a research that Fitzpatrick (2006) identifies is the importance of choosing the stimulus words and advises that they be selected carefully. Although the examined words in this paper are from one and the same domain, they are picked purposefully. The choice of words affects the speed of giving reaction words as Church and Hanks (2002) observed. As time is of no interest for the results here and no other circumstances are discerned as a possibility for hindering the conduction seriously, the stimulus words are as follows: bread, salt, tomato, egg, and fish. All of them, except for the word tomato, are in the New General Service List (NGSL) which consists of 2801 high-frequency words in English from a 273 million word subsection of the two billion word Cambridge English Corpus.

Although the original version of the questionnaire included 5 more words that were tested in the following order bread, salt, tomatoes, tea, eggs, pizza, fish, whisky, coffee and pasta, the research narrowed the range to bread, salt, tomatoes, eggs, and fish. The otherwise reasonable advice that concrete nouns as stimuli should be avoided since they produce predictable responses (Fitzpatrick, 2006) is ignored for the sake of making connections with the binomial issue easier. Also, it is useful to know another researcher’s (Rahimi, 2009:18) observations that concrete words elicit more paradigmatic responses than abstract words do. Moreover, other authours (De Deyne et al., 2019: 987) present word associations as a perfect tool to examine language and the processes involved, emphasizing the variety of stimuli that can be used disregarding the part of speech they belong to or whether they are abstract or concrete.

1.3. Participants

In order to compare the associations that learners of English make to the associations for native speakers and to establish whether the same stimuli trigger

associations different for Bulgarians living in England, the responses of three groups of participants were surveyed. In general, the study is based on the reaction words of 22 people who were given a free word association test (Test Type I) as a handout in class and 31 more were asked to complete a controlled online questionnaire with three options supplied (Test Type II).

Three main groups of informants who provide the data for the surveys:

1) Group A – Bulgarian college students where

A₁ consists of 13 Bulgarian students at Dobrich College. They have been studying English for two or more than two years, Age: 20 to 42 (average age 26);

A₂ comprises 9 Bulgarian students at Dobrich College who have been studying English for at least a year, Age: 24 to 48 (average age 34);

A₃ is a group of 15 Bulgarian students at Dobrich College. They have been studying English for three or more than three years, Age: 21 to 47 (average age 31);

The language level of the students is heterogeneous ranging from A1 to B2.

2) Group B presents 13 Bulgarian people who have been living in London for 8 to 13 years. Their age varies from 16 to 55.

3) Group C – 3 native speakers from England – London (Uxbridge), Cambridge, and Trowbridge. Age ≥ 50.

The small number of the native speakers can only give a slight idea and serve rather as a source giving a certain clue. Although in contact with some Bulgarian people, they have never been completely immersed in the culture. Set as a requirement in order to avoid assimilation caused by culture and traditions, this might allow responses be as authentic as possible. It should be admitted though that one of the informants is an inhabitant of the highly cosmopolitan London (Uxbridge), and the rest are from places more or less close to the capital. Naturally, such a small number of informants is insufficient for drawing reliable conclusions and this is the reason to fall back on some corpora. Moreover, a corpus gives the possibility to see what is typical and not so typical (Hunston, 2000: 3).

1.4. Procedure

Test Type I was given as a handout in class to group A₁ and A₂. Using the platform of survey.bg, Group A₃, Group B and Group C were able to do Test Type II since it was prepared as an online survey for the different groups:

Group A₃ <https://survey.bg/s/ez9Eb8SsgG>

Group B <https://survey.bg/s/ez71bHFILL>

Group C <https://survey.bg/s/yk+biCg6bG>

The approximate time registered for the test completion is 2 min. It coincides with the span allowed for completion for each group. All results were collected and processed manually. The same method was applied for the selection of the appropriate examples in the corpora.

2. Experiment

The first step in analyzing the results is to compare the reaction words given by the Bulgarian students in their mother tongue with those in the foreign language. A distinction between syntagmatic and paradigmatic associations is made, following the broader view (same lexical category with the stimulus word) shared by some scientist as mentioned by Zareva (2011:4).

The English associate words for the stimulus word bread are food, butter, eat, cheese, sandwich, course, white. The words given in Bulgarian are hrana (food), maslo

(butter), testo (dough), kozunak (Easter bread), trapeza (repast), sandwich (sandwich), byal (white), yadene (meal), obyad (lunch). The first three words in both languages are the dominant associations. Although the variety of reaction words in Bulgarian is greater than in English, two of them overlap, i.e. food and butter. A small number of syntagmatic associations is present in both languages (e.g. eat and byal (white)).

Salt produced pepper and salty as dominant associations in English, and the words that occurred only once were salad, dish, bad health, spice, white, tequila, while in Bulgarian zahar (sugar), cheren piper (pepper), podpravka (spice) were dominant among hrana (food), soleno (salty), yastiya (dishes), visoko krvavno (high blood pressure). The variety of words is almost the same for both languages and the predominance of paradigmatic associations is clear.

The dominant association concerning the stimulus word tomatoes for both languages is salad. But in English there is one more word, i.e. vegetable, and the words occurring once are sandwich, delicious, tasty, red, cucumbers, pizza. In Bulgarian some of the reaction words are the same in meaning. The list of words includes lytenitsa, sirene (cheese), zelenchuk (vegetable), cherven (red), rozov (pink), krastavitsi (cucumbers), gradina (garden), sochen (juicy), vkusen (tasty), obicham (I love). Although in both languages the number of syntagmatic associations is greater in comparison to the previous stimuli, they are still less than the paradigmatic ones.

To the stimulus fish the students reacted with the dominant word sea for both languages. There is another dominant word in English, i.e. chips, while in Bulgarian polezno (healthy) and ton (tuna) are produced. The rest of the words occur once in English – baked, delicious, salad, spa, cooker, Omega 3, restaurant, beach. The association field in Bulgarian is outlined with the words kartofi (potatoes), pechena (baked), parzhena (fried), vkusna (delicious), voda (water), safrid (scad), polezno (good). Both syntagmatic and paradigmatic associations can be found for the two languages.

As what concerns the stimulus word egg, it is interesting that there are not any dominant associations in English, and the reaction words are dinner, yolk, protein, yellow, omelette, eat, pan, healthy, boiled, chicken. Although some words with the same meaning occur in the association field in Bulgarian, the overall impression is that the Easter holiday, celebrated a couple of days before spreading the questionnaire, influenced the responses. The predominance of paradigmatic associations is observed with both languages.

As a summary three things stand out:

- 1) The variety of reaction words outlining the association field in Bulgarian outnumbers the answers given in English;
- 2) Some of the dominant associations in Bulgarian overlap with those in English. The only exception is the stimulus word egg.
- 3) There is an almost equal number of clear syntagmatic associations for both languages but the paradigmatic associations (68,3% in BG and 71,1% in ENG) outnumber them significantly.

This is to be taken advantage of in foreign language teaching. The importance of lexical class is pointed out by Zareva (2011). The results of her experiment showed that nouns were mostly linked to nouns and she came to the conclusion that they “should be taught in connection to other nouns since L2 learners seem to naturally prefer this kind of paradigmatic connections for the lexical class of nouns” (Zareva,

2011:14). Furthermore, Rahimi (2009: 22) reminds that “...words are meaningfully connected in the mental lexicon and should therefore be taught in a similar way.” This seems to be in favour of the idea promoted with this paper that nouns open the opportunity for teaching binomials, especially those consisting of nouns as conjuncts.

Therefore, the second step is to compare the already commented results with the those of a slightly different questionnaire as the conjunction *and* is added after each stimulus word. This is supposed to allow production of binomial pairs. The frequency of responses is significant as De Deyne et al (2019: 994) describe it, it “provides us with an idea about which words are central or salient in the lexicon and might determine how efficiently lexical information can be retrieved”.

The results are visualized with the following pictures where the reaction words in English are in white, the response words in Bulgarian are in pink, and the overlapping responses for the stimulus word with and without a conjunction are given in green. The dominant associates are at the top, while the reaction words that occur only once as a response are below the stimulus word.

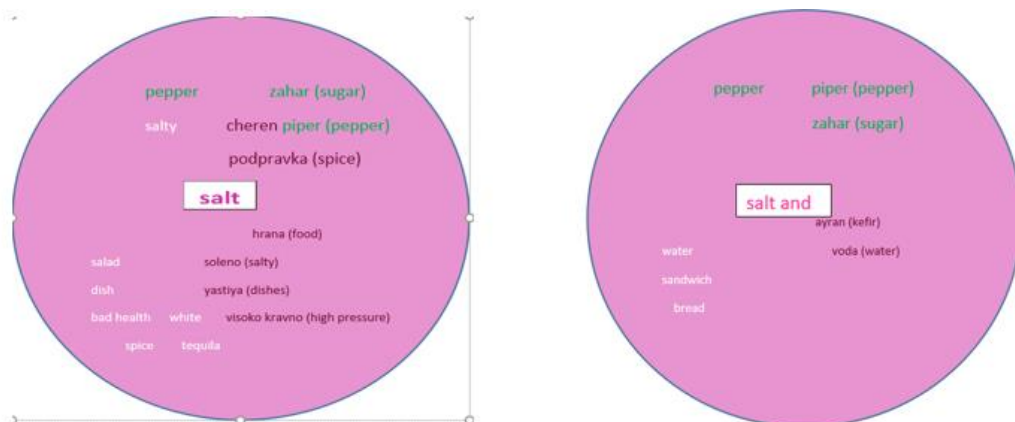
Picture 1 The association field of the word bread without a conjunction and the association field of the word with a conjunction.



With the addition of the conjunction the production of reaction words decreases. While in English two reaction words (butter and cheese) occur again, adding the conjunction seems to affect the choice of reaction word in Bulgarian where salt and water appear as well as the popular expression bread and circuses.

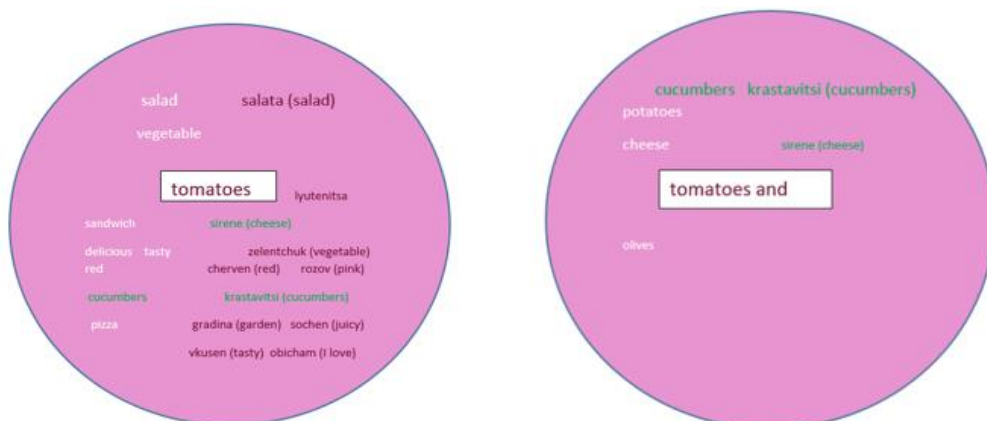
Picture 2 shows a significant similarity of the dominant associates for both languages. An interesting occurrence is observed with a response word in English, i.e. salt and bread, while the reversed order of the conjuncts appears in Bulgarian (see Picture 1, i.e. hlyab i sol (bread and salt)). Another difference is that the latter is among the dominant associations, while the former occurs only once.

Picture 2 The association field of the word salt without a conjunction and the association field of the word with a conjunction.



The stimulus word tomatoes as compared to *tomatoes and* follows the same regularity as in the two pictures above. Less diversity is observed when a conjunction is added. But Picture 3 differs from the two above in the number of occurrences. While without a conjunction the response words that overlap occur only once, with a conjunction they are dominant. The stimulus word tomatoes produces cucumbers in both languages, no matter if a conjunction is added or not. Again regardless of the presence or absence of the conjunction, sirene (cheese) is quite a natural association in Bulgarian.

Picture 3 The association field of the word tomatoes without a conjunction and the association field of the word with a conjunction.



Egg is the only stimulus word which does not have any overlap in the responses in English, but the students have given similar answers in Bulgarian.

Picture 4 The association field of the word eggs without a conjunction and the association field of the word with a conjunction.



The stimulus word fish produces the dominant word chips in English with and without a conjunction added. In Bulgarian we have kartofi (potatoes) and more (sea).

Picture 5 The association field of the word fish without a conjunction and the association field of the word with a conjunction.



The general impression from the five pictures above is that the attachment of a conjunction makes the association field different in quality and in quantity. Nevertheless, as what concerns quality, there is a similarity to some extent. The addition of the conjunction seems to hinder the abundance of reaction words. It is obvious especially with first three stimuli. Although, it restricts in a way, there are still some common responses.

The next step in the experiment is to discover the preference in responses in case the respondents are suggested particular options to choose among. Table 1 displays the results.

Table 1 Frequency of the three options with three different groups of respondents

TYPE II QUESTIONNAIRE (CONTROLLED)				
First conjunct	Second conjunct	Number of occurrences Group A3 (Bulgarian students)	Number of occurrences Group B (Bulgarian people living in the UK)	Number of occurrences Group C (native speakers)
bread and	butter	5	10	3
	cheese	6	3	0
	salt	4	0	0
salt and	sugar	3	1	0
	pepper	13	12	3
	bread	0	0	0
tomatoes and	cheese	8	6	1
	cucumbers	5	7	2
	pepper	2	0	0
eggs and	bacon	10	12	3
	tuna	0	0	0
	cheese	5	1	0
fish and	bread	2	0	0
	chips	10	13	3
	salad	3	1	0

* Although not instructed to do so, the respondents often gave secondary responses in addition to their primary ones which explains the difference of the total number. All are included without being specified further.

According to the survey, most of the participants have chosen one and the same option. Despite the fact that eggs and bacon could be called indisputable favourites, the results show slight fluctuation concerning the rest of the options. The hesitation between two, or sometimes even all the three, is clearer with Group A₃, e.g. bread and butter/cheese/salt, while Group B which appears somehow in between Bulgarian and native way of thinking, keeps a part of the Bulgarian reasoning but at the same time is strongly influenced by the surrounding English language environment as most of the chosen answers overlap with those of the native speakers.

With the last step of the experiment the findings so far are confirmed by means of two corpora. The numbers show clearly the preferences. In addition, Table 2 reveals a minor possibility to reverse bread and salt in Bulgarian, whereas in English it is completely unacceptable.

Table 2 Frequency of the binomial occurrences in the two corpora

First conjunct	Second conjunct	Number of occurrences in BYU-British National Corpus	Number of occurrences in Bulgarian National Corpus
bread and	butter	201	58 (95)
	cheese	81	227 (352)
	salt	2	114 (139)
salt and	sugar	8	8 (30)
	pepper	198	42 (61)
	bread	0	4 (139)
tomatoes and	cheese	1	2 (7)
	cucumbers	1	26 (50)
	pepper	0	3 (4)
eggs and	bacon	23	31 (81)
	tuna	0	1 (2)
	cheese	10	3 (12)
fish and	bread	0	7 (29)
	chips	220	4 fries 13 (15)
	salad	0	1 (2)

*The whole number of occurrences are put in brackets and the number of those occurring as binomials are put in front of them.

Salt and pepper seems to be the most preferable for both languages and this could make it easier for the learners if they are drawn the attention to the expression. The three options concerning tomatoes do not offer any fixed usage for the English language, while in Bulgarian it co-occurs with cucumbers definitely. Surprisingly similar is the situation for eggs and bacon as well as eggs and cheese for the native and the foreign language. A possible explanation of the fact might be the sources for the Bulgarian corpora as some of them turn out to be translated novels from English. Fish and chips is more or less culturally significant for the English, while for the Bulgarians there are other options such as potatoes, or French fries.

3. Conclusion

Conducting questionnaires and giving some follow-up activities to the students in the seminars further on is to influence learners' interest in language pairs and as a result help them understand better some typical structures in the foreign language. This would also help them acquire binomials easily as an active vocabulary. The fact that there is a larger portion of paradigmatic associations according to Test Type I in both languages leads to certain inferences. As by rule paradigmatic associations refer to words from one and the same word class, just like binomials have a word from the same word class in both conjuncts, such a predominance might suggest the importance to include binomials while teaching English in order to add adequately members to the association field of the examined words. The answers given in the survey confirm that the most preferred response options are part of the association field not only for native speakers but for all of the examined groups. The minor differences could be used properly for the process of learning.

Another thing to point out is that regardless of the small number of respondents and the different number of participants for each group, there seems to be some regularity. If The Bulgarian students' choice fluctuates between two or sometimes between all the three options, the responses given by native speakers, in contrast, are unified on a particular choice. The answers of the Bulgarian people living in the UK turn out to be intermediate as they show the way of foreigner's thinking but at the same time due to the influence of their surrounding language atmosphere, they seem to be much more uniform in comparison to the Bulgarian students' responses. The consecutive consideration of Group A₃, Group B and Group C's responses show a gradation in terms of uniformity of choice. BYU-BNC and BNC do not show any significant deviation from the survey results. Both corpora confirm the examined preferences of the informants.

Therefore, it seems appropriate to suggest that introducing binomials while practicing new vocabulary would help students to acquire new words better by giving a suitable information since mind makes quite similar connections in this same direction. The fact that some of the binomials are idiomatic expressions (e.g. bread and butter) proves the importance and usefulness of paying such an attention.

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