7-1-2023

What Was More Frequently Used -- "And" or "Or": Based on Analysis of European Languages

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Abstract Traditional logic has two main connectives: "and" and "or". A natural question is: which of the two is more frequently used? This question is easy to answer for the current usage of these connectives – we can simply analyze all the texts, but what can we say about the past usage? To answer this question, we use the known linguistics fact that, in general, notions that are more frequently used are described by shorter words. It turns out that in most European languages, the word for "and" is shorter – or of the same length – as the word for "or". This seems to indicate that in these languages, "and" was used more frequently. The only four exceptions are languages of the British Isles and of Greece, where most probably "or" was used more frequently. In this paper, we propose a possible explanation for these exceptions.

1 Formulation of the Problem

What was more frequently used: "and" or "or"? Traditional logic has two basic logical operations: "and" and "or". A natural question is: which of these two operations is more frequently used?

We can easily find out which is used more frequently now. By analyzing the current texts, we can check which of the two operations is used more now.

How can we answer the same question about the past use? How can we detect the past use? In principle, we can also look at the texts. However:

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- there were fewer texts,
- and, since most people were illiterate, the texts may not be a good indication of how most people were using these two connectives.

What we do in this paper. In this paper, we provide a possible way to answer this questions – based on a known linguistic fact that the frequency of using a word is negatively correlated with this word's frequency. Our conclusion is that "and" was more frequent, with two examples – languages of the British Isles and Greece. We also speculate on possible reasons for these two exceptions to the general phenomenon.

2 Methodology

Main idea. Our analysis is based on a known linguistic idea, that the more frequently a term is used, the shorter it becomes. There are many examples of such shortening in the 20 century:

- As cars became more widely use, the long original word "automobile" was replaced by a shorter word "car". For a while, the word "automobile" only appeared in yellow pages of the phone books, that listed businesses by topics – but now, there are no yellow pages at all.
- Similarly, a longer word "refrigerator" became replaces by a shorter "fridge".
- As air conditioning became a norm – at least in the hot areas of the US – the term got shortened to AC, etc.

Vice versa, for terms that are used more rarely, original short terms become obsolete and no longer used.

There are similar phenomena in other languages (and in professional slangs as well). For example, in the 19 century Russia, when the country was mostly agricultural, there were several short words for different weather conditions – the issue of great important to a farmer. For example, there was a special term "vyodro" for a good weather. Nowadays, when a new edition of books by 19 century writers appear, this – and similar – terms need to be explained in a special footnote.

So, to analyze which of the two main logical connectives was more frequently used, a natural idea is to compare the relative length of the words corresponding to "and" and "or".

What we did. We used Google Translate [1] to find words corresponding to "and" and "or" in different European languages. Of all the languages provided by Google Translate, we selected European languages since they use familiar alphabet in which it was easier for us to count the length of each word. For languages in a different alphabet – such as Russian – we used transliterations into Latin alphabet provided by Google Translate.

Let us describe the results of this comparison.

3 Results

How we present the results. We grouped the results in several tables. Languages were divided into tables based on the difference d between the length of the "and"-word and the length of "or"-word. This difference ranged from -2 to 3. Within each group, we listed languages in alphabetic order. The results are described in Tables 1, 2, 3, 4, 5, 6, and 7. Table 8 summarizes the results.

Language	"and"-word	"or"-word
Greek	kai	i
Irish	agus	no

Table 1 Languages for which $d = -2$

Language	"and"-word	"or"-word
English	and	or
Scottish Gaelic	agus	neo

Table 2 Languages for which $d = -1$

Language	"and"-word	"or"-word
Albanian	dhe	ose
Armenian	yev	kam
Basque	eta	edo
Catalan	i	o
Corsican	e	o
Dutch	en	of
French	et	ou
Georgian	da	an
Italian	e	o
Latin	et	or
Slovenian	in	oz
Spanish	y	o
Western Frisian	en	of

Table 3 Languages for which $d = 0$

Language	"and"-word	"or"-word
Estonian	ya	voi
Finnish	ja	tai
Galician	e	ou
Icelandic	og	eda
Latvian	un	vai
Portuguese	e	ou
Romanian	si	sau
Tatar	hem	yaki
Yiddish	aun	oder

Table 4 Languages for which $d = 1$

Language	"and"-word	"or"-word
Belarussian	i	abo
Bosnian	i	ili
Bulgarian	i	ili
Croatian	i	ili
Hungarian	es	vagy
Lithianian	ir	arba
Luxembourgish	an	oder
Macedonian	i	ili
Maltese	u	jew
Polish	i	lub
Russian	i	ili
Serbian	i	ili
Swedish	och	eller
Turkish	ve	veya
Ukrainian	i	abo
Welsh	a	neu

Table 5 Languages for which $d = 2$

Language	"and"-word	"or"-word
Czech	a	nebo
Danish	og	eller
Norwegian	og	eller

Table 6 Languages for which $d = 3$

General summary. The average difference is $d = 1$, the median difference is also $d = 1$. Out of 46 languages that we considered, in only four languages "or" is shorter: English, Greek, Irish, and Scottish Gaelic.

Language	"and"-word	"or"-word
Slovak	a	alebo

Table 7 Languages for which $d = 4$

Value of the difference d	-2	-1	0	1	2	3	4
Number of languages with this d	2	2	13	9	16	3	1

Table 8 Summary of the results

Possible explanation for the four exceptions. When do we use "or"? Often, we use it when we have a freedom of choice: we can have ice cream or pie for dessert, we can take a bus or a train, etc. So, it is reasonable to expect that "or" would be used more – and, as a consequence, be described by a shorter word – in countries that had more freedom of choice.

From this viewpoint, the fact that the four languages for which "or" is longer than "and" makes perfect sense:

- Greece was the mother of democracy, and
- the British Isles were, for a long time, most democratic place in Europe.

Of course, in both cases, it was limited democracy:

- ancient Greeks owned slaves, and
- in Britain, most common folks did not have voting rights,

but still, they had more democracy than other European countries.

Acknowledgments

References

1. https://translate.google.com, accessed on July 24, 2023