

The Types Attitude to and Attitude Towards in the COCA and ChatGPT

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Abstract

The main purpose of this paper is to compare the type attitude to and the type attitude towards in the COCA and ChatGPT. A major point of this paper is that while the type attitude to and the type attitude towards admit the same property in four genres, they induce no similarity in four genres. This in turn indicates that they are 50% the same in the so-called ranking analysis of eight genres. A point to note is that while these two types are the closest in the TV/movie genre, they are the furthest from each other in the newspaper genre. A further point to note is that when it comes to the standard deviation of the type attitude to, its frequency is roughly larger than 132.5-29.438 and smaller than 132.5+29.438. Talking about the standard deviation of the type attitude towards, its frequency is roughly larger than 171.375-41.601 and smaller than 171.375+41.601. This amounts to saying that the type attitude towards is being used more frequently. When it comes to the COCA, the type attitude to and the type attitude towards have 10 collocations in common in the top 30. From this, it seems clear that they are about 33.33% the same in the top 30. Finally, it is worthwhile noting that in ChatGPT, the type attitude to and the type attitude towards have 12 collocations in common in the top 25. It can thus be inferred that they are 48% the same in the so-called collocation analysis of the top 25.

Keywords: COCA, ChatGPT, token, type, similarity, collocation, standard deviation

Introduction

A specific goal of this paper is to compare the type *attitude to* and the type *attitude towards* in the COCA and ChatGPT. To begin with, we aim to compare the use of the type *attitude to* and that of the type *attitude towards* in eight genres of the Corpus of Contemporary American English (COCA). Put differently, we probe into their ranking in eight genres (of the COCA). This method leads us to observe how similar they are in eight genres. Second, we aim at comparing the two types by employing the Euclidean distance. More specifically, this method leads us to observe how close they are in eight genres. By measuring the distance between the type *attitude to* and the type *attitude towards* in eight genres, we can observe how similar they are. Third, we attempt to compare these two types by using the term standard deviation. By using it, we can observe how frequently they occur in the COCA. Fourth, we

aim to inquire into the collocations of the type *attitude to* and the type *attitude towards* in the COCA. By observing their collocations in the COCA, we can see how similar they are. Finally, we probe into the collocations of the type *attitude to* and the type *attitude towards* that ChatGPT provides. We attempt to compare the collocations of the type *attitude to* and those of the type *attitude towards*.

2. Results

2.1. The Similarity between the type attitude to and the type attitude towards in eight genres

This section is devoted to inquiring into the similarity between the type *attitude to* and the type *attitude towards* in the COCA. By observing the ranking of eight genres, we can observe how close they are in the COCA. Table 1 shows the frequency of the type *attitude to* and the type *attitude towards* in eight genres (of the COCA):

Table 1 Frequency of the type attitude to and the type attitude towards

Type	All	Blog	Web	TV/M	Spok	Fic	Mag	News	Acad
Attitude to	1,060	190	169	47	68	55	137	103	291
Attitude towards	1,371	327	254	41	204	29	45	12	459

It must be noted that as indicated in Table 1, while the overall frequency of the type *attitude to* is 1,060 tokens, that of the type *attitude towards* is 1,371 tokens. This in turn implies that Americans prefer to use the type *attitude towards*. However, it does not necessarily mean that Americans do not like using the type *attitude to*.

Now attention is paid to the genre frequency of the two types in the COCA. It is worthwhile to consider the academic genre. Quite interestingly, the type *attitude* and the type *attitude towards* rank first in the academic genre (291 tokens vs. 459 tokens in the academic genre), thereby indicating that those two types exhibit the same characteristic. Note, however, that in the academic genre, the use of the type *attitude towards* is by far higher than that of the type *attitude to*. We take it as implying that the former is preferred over the latter in the academic genre. To sum up, the type *attitude to* and the type *attitude towards* share the same pattern in the academic genre, thus resulting in a high degree of similarity.

It must be emphasized that in the blog genre, these two types rank second (190 tokens vs. 327 tokens). What is interesting is that these two types exhibit the sameranking in the blog genre. Put differently, they reveal a high degree of similarity (the same property). Notice, however, that American bloggers tend to prefer to use the type *attitude towards* in their blog. It can be inferred that the use of the type *attitude towards* is much higher than that of the type *attitude to* in the blog genre.

It is particularly noteworthy that the type *attitude to* and the type *attitude towards* induce the same characteristic in the web genre. Similarly, they rank third in web genre, thus being deemed to be identical in the web genre. Yet, it should be pointed out that as exemplified in Table 1, the type *attitude towards* is favored over the type *attitude to* by Americans. This fact may be derived from the fact that the frequency of the former is still higher than that of the latter.

It is appropriate to mention that while in the magazine genre, the type *attitude to* ranks fourth, in the spoken genre, the type *attitude towards* ranks fourth. Quite interestingly, these two types show the different aspect in that they are different from each other in rank-four. It is important to mention that American journalists prefer to use the type *attitude to* in their magazines. It is worth noticing, on the other hand, that in the spoken genre, the type *attitude towards* is preferred over the type *attitude to* by Americans. What this suggests is that Americans like using the former in daily conversation. It is interesting to observe that while in the newspaper genre, the type *attitude to* ranks fifth, in the magazine genre, the type *attitude towards* ranks fifth. Note that these two types behave differently in that they are different in rank-five. It seems thus reasonable to mention that these two types admit a low degree of similarity in rank-five. Notice, however, that in the newspaper genre and the magazine genre, the type *attitude to* is favored over the type *attitude towards* by American journalists.

It is worth mentioning that while in the spoken genre, the type *attitude to* ranks sixth, in the TV/movie genre, the type *attitude towards* ranks sixth. What this suggests is that these two types induce no similarity in rank-six. Yet, what is interesting is that in the TV/movie genre, the type *attitude to* may be preferred over the type *attitude towards* by American celebs.

It would be unfair not to mention that in the fiction genre, these two types rank seventh. That is to say, they admit the same characteristic in rank-seven, hence resulting in a high degree of similarity. Note, however, that American writers like using the type *attitude to* in their novels. It is clear from the fact that the use of the type *attitude to* is slightly higher than that of the type *attitude towards*, as exemplified in Table 1.

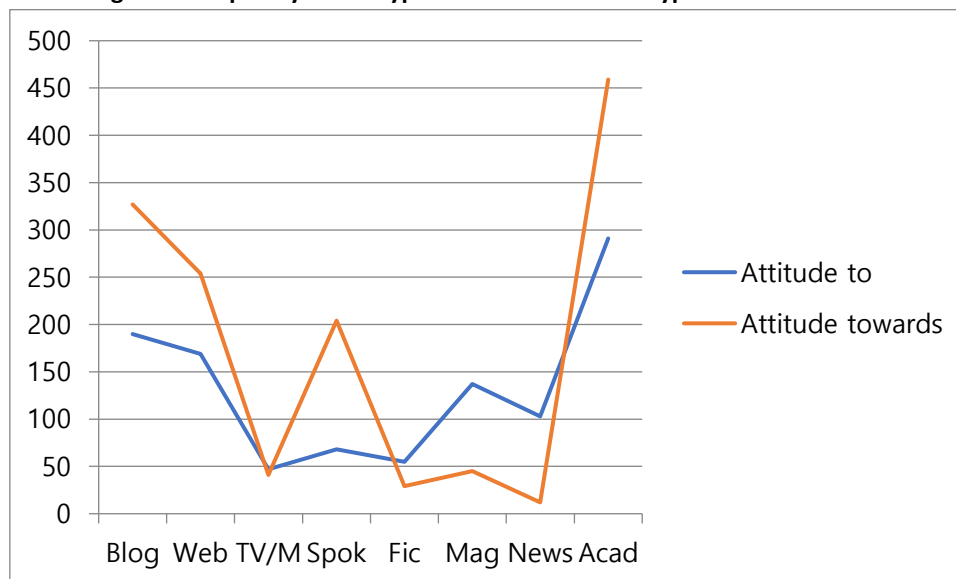
It is interesting to point out that while in the TV/movie genre, the type *attitude to* ranks eighth, in the newspaper genre, the type *attitude*

towards ranks eighth. This seems to suggest that these two types induce a low degree of similarity in rank-eight. Yet, it must be pointed out that in two genres, the type *attitude to* may be preferred over the type *attitude towards* by Americans. To sum up, while the type *attitude to* and the type *attitude*

towards admit the same property in four genres, they induce no similarity in four genres, which in turn indicates that they are 50% the same in the ranking analysis of eight genres.

The following graph shows the use of each type in eight genres, respectively:

Figure 1 Frequency of the type *attitude to* and the type *attitude towards*



2.2 The Euclidean Distance

In the following, we aim to probe into the so-called distance between the type *attitude to* and the type *attitude towards* in eight genres (of the COCA). By

adopting the Euclidean distance, we attempt to compare two types in eight genres. The following table shows the definition of the Euclidean distance:

Table 2 Euclidean Distance

$$\sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \dots + (p_n - q_n)^2} = \sqrt{\sum_{i=1}^n (p_i - q_i)^2}$$

Note that the more the distance between the type *attitude to* and the type *attitude towards* is close, the more they have similarities. The following table

shows the Euclidean distance between these two types:

Table 3 Euclidean distance between the type *attitude to* and the type *attitude towards*

GENRE	BLOG	WEB	TV/M	SPOK	FIC	MAG	NEWS	ACAD
Percentage of attitude to	17.92	15.94	4.43	6.41	5.18	12.92	23.85	23.96
Percentage of attitude towards	23.85	23.96	2.99	14.87	2.11	3.28	0.87	33.47
Euclidean	5.93	8.02	1.44	8.46	3.07	9.64	22.98	9.51

distance								
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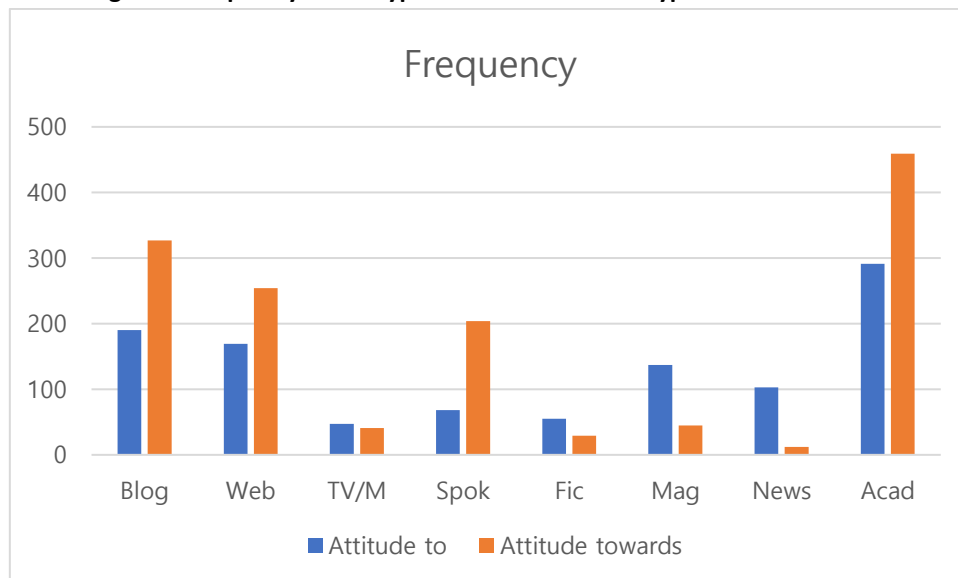
It is important to mention that in the newspaper genre, the type *attitude to* may be the furthest from the type *attitude towards*. To be more specific, the distance between these two types is 22.98, which is the highest, thus resulting in the lowest similarity. It is significant to note that in the TV/movie genre, the type *attitude to* may be the nearest to the type *attitude towards*. This amounts to saying that they induce the highest similarity. It is interesting to consider the fiction genre. The distance between the type *attitude to* and the type *attitude towards* is 3.07, which is the second lowest. It is clear from this that they admit a high degree of similarity in the

fiction genre. What is interesting is that in the blog genre, the distance between these two types is 5.93, which is the third lowest. From this, it is evident that in the blog genre, they induce a high degree of similarity. It therefore seems reasonable to mention that while these two types are the closest in the TV/movie genre, they are the furthest from each other in the newspaper genre.

2.3 Standard Deviation

In this section, we aim to compare the type *attitude to* and the type *attitude towards* in terms of the so-called standard deviation. To begin with, let us take a look at the following graph:

Figure 2 Frequency of the type *attitude to* and the type *attitude towards*



It is worthwhile pointing out that while the average frequency of the type *attitude to* is 132.5 tokens, that of the type *attitude towards* is 171.375 tokens, as exemplified in Table 4. It is worth mentioning that in the blog, web, and magazine genres and the academic genre, the frequency of the type *attitude to* is more than its average frequency. This in turn indicates that in these four genres, the type *attitude to* was used frequently. It is worth observing that in the blog and web genres and the spoken and

academic genres, the frequency of the type *attitude towards* is more than its average frequency. From all of this, it is clear that in these four genres, the type *attitude towards* was much used. Most importantly, as indicated in Table 4, in the blog and web genres and the academic genre, these two types were used frequently. This amounts to saying that in these three genres, the type *attitude to* and the type *attitude towards* were much used by Americans.

Now attention is paid to standard deviation:

Table 4 Standard Deviation

Type	Mean	Deviation	Standard Deviation
Attitude to	132.5	866.625	29.438
Attitude towards	171.375	1,730.656	41.601

Perhaps it is worthwhile noting that the type *attitude towards* was much used in America, compared to the type *attitude to*, as shown in Table 4. As illustrated in Table 4, while the standard deviation of the type *attitude to* is 29,438, that of the type *attitude towards* is 41.601. To be more specific, when it comes to the standard deviation of the type *attitude to*, its frequency is roughly larger than $132.5-29.438$ and smaller than $132.5+29.438$. On the other hand, talking about the standard deviation of the type *attitude towards*, its frequency

is roughly larger than $171.375-41.601$ and smaller than $171.375+41.601$. From all of this, it seems clear that the type *attitude towards* is being used more frequently.

2.4 Collocations of the type *attitude to* and the type *attitude towards* in the COCA

This section is focused on comparing the collocations of the type *attitude to* and the type *attitude towards* in the COCA. Table 5 shows the collocations of these two types:

Table 5 Collocations of the type *attitude to* and the type *attitude towards* in the COCA

N U M B E R	COLLOCATION	FREQUENCY	COLLOCATION	FREQUENCY
1	ATTITUDE TO CHRISTIANITY	30	ATTITUDE TOWARDS LIFE	33
2	ATTITUDE TO LIFE	22	ATTITUDE TOWARDS WOMEN	26
3	ATTITUDE TO SCHOOL	13	ATTITUDE TOWARDS CAPITAL	25
4	ATTITUDE TO WOMEN	10	ATTITUDE TOWARDS SEXUALITY	22
5	ATTITUDE TO PRAYER	6	ATTITUDE TOWARDS SEX	17
6	ATTITUDE TO SEX	5	ATTITUDE TOWARDS FOOD	8
7	ATTITUDE TO RELIGION	4	ATTITUDE TOWARDS HOMOSEXUALITY	8
8	ATTITUDE TO MODERNITY	3	ATTITUDE TOWARDS MONEY	8
9	ATTITUDE TO PIRACY	3	ATTITUDE TOWARDS ENGLISH	7
10	ATTITUDE TO EDUCATION	3	ATTITUDE TOWARDS TECHNOLOGY	7
11	ATTITUDE TO AUTHORITY	3	ATTITUDE TOWARDS THINGS	7
12	ATTITUDE TO CAPITAL	3	ATTITUDE TOWARDS WORK	7
13	ATTITUDE TO BUSINESS	3	ATTITUDE TOWARDS MATHEMATICS	6
14	ATTITUDE TO REALITY	3	ATTITUDE TOWARDS SCIENCE	6

15	ATTITUDE TO SCIENCE	3	ATTITUDE TOWARDS AUTHORITY	5
16	ATTITUDE TO WORK	3	ATTITUDE TOWARDS LEISURE	5
17	ATTITUDE TO DEATH	2	ATTITUDE TOWARDS DEATH	4
18	ATTITUDE TO DONATION	2	ATTITUDE TOWARDS EDUCATION	4
19	ATTITUDE TO ANIMALS	2	ATTITUDE TOWARDS IMMIGRATION	4
20	ATTITUDE TO CLIMATE	2	ATTITUDE TOWARDS PARTICIPATION	4
21	ATTITUDE TO ABORTION	2	ATTITUDE TOWARDS PEACE	4
22	ATTITUDE TO GAYS	2	ATTITUDE TOWARDS PEOPLE	4
23	ATTITUDE TO HEALTH	2	ATTITUDE TOWARDS RELIGION	4
24	ATTITUDE TO IMPORTANCE	2	ATTITUDE TOWARDS RISK	4
25	ATTITUDE TO NOISE	2	ATTITUDE TOWARDS SCHOOL	4
26	ATTITUDE TO POLITICS	2	ATTITUDE TOWARDS HUMANS	3
27	ATTITUDE TO PRIVACY	2	ATTITUDE TOWARDS HISTORY	3
28	ATTITUDE TO SNAGS	2	ATTITUDE TOWARDS GOVERNMENT	3
29	ATTITUDE TO TIME	2	ATTITUDE TOWARDS EXISTENCE	3
30	ATTITUDE TO UNIVERSITY	2	ATTITUDE TOWARDS COUNTRIES	3

It is vital that the expression *attitude to Christianity* obtained the highest frequency (30 tokens). This in turn suggests that the noun *Christianity* as the collocation of the type *attitude to* was the most widely used one. Quite

interestingly, the expression *attitude to Christianity* is followed by the expression *attitude to life* whose frequency is 22 tokens. What is interesting is that the expression *attitude to school* ranks third (13 tokens) in the COCA. It is interesting to point out that the expression *attitude to women* was the fourth most widely used one in the COCA. It is worth mentioning that the expression *attitude to women* is followed by the expression *attitude to player* whose frequency is 6 tokens. It is thus reasonable to

mention that the expression *attitude to Christianity* is the most widely occurred one in the COCA, followed by the expression *attitude to life*, the expression *attitude to school*, the expression *attitude to women*, and the expression *attitude to player*, in descending order. Noteworthy is that the expression *attitude to English* ranks ninth (7 tokens) in the COCA. It is particularly noteworthy that the expression *attitude towards life* obtained the highest frequency (33 tokens). Perhaps it is worthwhile to consider the expression *attitude towards women* whose frequency is 26 tokens. This in turn implies that this expression is the second most widely occurred one in the COCA. It is worth pointing out that the expression *attitude to women* is followed by

the expression *attitude towards capital* whose frequency is 25 tokens. It should also be pointed out that the expression *attitude towards sexuality* ranks fourth (22 tokens) in the COCA. It is interesting to observe that the expression *attitude towards sexuality* is followed by the expression *attitude towards sex*. It therefore seems reasonable to mention that the expression *attitude towards life* was the most widely used one in the COCA, followed by the expression *attitude towards women*, the expression *attitude towards capital*, the expression *attitude towards sexuality*, the expression *attitude towards sex*, in descending order. Most importantly, the type *attitude to* and the type *attitude towards*

have 10 collocations in common in the top 30. This in turn indicates that they are about 33.33% the same in our list. However, this does not necessarily mean that they do not have any other collocations in common. For the analysis of machine learning, deep learning, and big data, see Kang (2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g).

2.5 Collocations of the type *attitude to* and the type *attitude towards* that ChatGPT provides

In what follows, we aim at going over the collocations of the type *attitude to* and the type *attitude towards* that ChatGPT provides. We aim to compare the collocations of the type *attitude to* and the type *attitude towards* that the ChatGPT provides:

Table 6 Collocations of the type *attitude to* and the type *attitude towards* that ChatGPT provided

NUMBER	COLLOCATION	COLLOCATION
1	ATTITUDE TO WORK	ATTITUDE TOWARDS LIFE
2	ATTITUDE TO RELATIONSHIPS	ATTITUDE TOWARDS WORK
3	ATTITUDE TO EDUCATION	ATTITUDE TOWARDS RELATIONSHIPS
4	ATTITUDE TO HEALTH	ATTITUDE TOWARDS CHANGE
5	ATTITUDE TO POLITICS	ATTITUDE TOWARDS SUCCESS
6	ATTITUDE TO AUTHORITY	ATTITUDE TOWARDS FAILURE
7	ATTITUDE TO TECHNOLOGY	ATTITUDE TOWARDS AUTHORITY
8	ATTITUDE TO RELIGION	ATTITUDE TOWARDS RESPONSIBILITY
9	ATTITUDE TO WEALTH	ATTITUDE TOWARDS DIVERSITY
10	ATTITUDE TO SUCCESS	ATTITUDE TOWARDS CHALLENGES

11	ATTITUDE TO FAILURE	ATTITUDE TOWARDS OPPORTUNITIES
12	ATTITUDE TO DIVERSITY	ATTITUDE TOWARDS INNOVATION
13	ATTITUDE TO CHANGE	ATTITUDE TOWARDS EDUCATION
14	ATTITUDE TO CREATIVITY	ATTITUDE TOWARDS HEALTH
15	ATTITUDE TO RISK	ATTITUDE TOWARDS TECHNOLOGY
16	ATTITUDE TO ENVIRONMENT	ATTITUDE TOWARDS NATURE
17	ATTITUDE TO COMMUNICATION	ATTITUDE TOWARDS WEALTH
18	ATTITUDE TO COMPETITION	ATTITUDE TOWARDS POVERTY
19	ATTITUDE TO JUSTICE	ATTITUDE TOWARDS SOCIETY
20	ATTITUDE TO HAPPINESS	ATTITUDE TOWARDS POLITICS
21	ATTITUDE TO COMMUNITY	ATTITUDE TOWARDS RELIGION
22	ATTITUDE TO ART	ATTITUDE TOWARDS TIME
23	ATTITUDE TO FASHION	ATTITUDE TOWARDS FUTURE
24	ATTITUDE TO ENTERTAINMENT	ATTITUDE TOWARDS PAST
25	ATTITUDE TO TIME	ATTITUDE TOWARDS SELF

It is vital that the first collocation of the type *attitude to* that ChatGPT provided is the noun *work*. Simply put, the expression *attitude to life* is the first one that ChatGPT recommended. It is worthwhile saying that the second collocation that it provided is the

noun *relationships*. It must be said that the noun *education* is the third one that ChatGPT provided. It must be stressed that the fourth collocation that ChatGPT provided is the noun *health*. It is important to mention that the fifth collocation that it

recommended is the noun *politics*. Put differently, the expression *attitude to politics* is the fifth one that ChatGPT recommended. It seems thus reasonable to mention that the nouns *work* is the most preferred by ChatGPT, followed by the noun *relationships*, the noun *education*, the noun *health*, and the noun *politics*, in that order.

It is worthwhile pointing out that the first collocation of the type *attitude towards* that ChatGPT recommended is the noun *life*. Put differently, the expression *attitude towards life* is the one that ChatGPT provided first. It must be emphasized that the expression *attitude towards work* is the second one that ChatGPT provided. It therefore seems clear that these two types have the collocation *work* in common. It is worth saying that the third collocation that ChatGPT recommended is the noun *relationships*. Again, these two types have this collocation in common in the top 25. It is interesting to note that the noun *change* is the fourth one that ChatGPT provided. It is significant to note that the collocation *success* is the fifth one that ChatGPT recommended. It therefore seems reasonable to maintain that the noun *life* is the one that ChatGPT prefers, followed by the noun *work*, the noun *relationships*, the noun *change*, and the noun *success*, in descending order. Most importantly, the type *attitude to* and the type *attitude towards* have 12 collocations in common in the top 25. This in turn implies that they are 48% the same in the so-called collocation analysis of the top 25.

3. Conclusion

To sum up, we have compared the type *attitude to* and the type *attitude towards* in the COCA and ChatGPT. In section 2.1, we have contended that while the type *attitude to* and the type *attitude towards* admit the same property in four genres, they induce no similarity in four genres. This in turn indicates that they are 50% the same in the so-called ranking analysis of eight genres. In section 2.2, we have maintained that while these two types are the closest in the TV/movie genre, they are the furthest from each other in the newspaper genre. In section 2.3, we have argued that when it comes to the standard deviation of the type *attitude to*, its frequency is roughly larger than 132.5-29.438 and

smaller than 132.5+29.438. We have also argued that talking about the standard deviation of the type *attitude towards*, its frequency is roughly larger than 171.375-41.601 and smaller than 171.375+41.601. This amounts to saying that the type *attitude towards* is being used more frequently. In section 2.4, we have further argued that when it comes to the COCA, the type *attitude to* and the type *attitude towards* have 10 collocations in common in the top 30. This in turn indicates that they are about 33.33% the same in the top 30. Finally, we have shown that in ChatGPT, the type *attitude to* and the type *attitude towards* have 12 collocations in common in the top 25. This in turn implies that they are 48% the same in the so-called collocation analysis of the top 25.

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