Comparative Study of English Synonyms Based on COCA Corpus

-- A Case Study of Reduce and Diminish

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Abstract

The distinction between near-synonyms has always been a difficult task for English learners in China. Based on Corpus of Contemporary American English (COCA), this article provides a comprehensive description of the similarities and differences between a pair of English synonyms "reduce" and "diminish" in terms of word frequency, collocation, colligation and semantic prosody, in order to support and help English learners to better grasp the usage of these two synonyms, and thus provide a reference for vocabulary teaching and second language acquisition (SLA). The results show that the two synonymous verbs reduce and diminish show some differences in terms of word frequency, collocation, colligation and semantic prosody. Secondly, the two verbs are more often used in academic domains and formal discourse, and they are often combined with nouns, especially abstract nouns. In addition, reduce is frequently used with negative abstract nouns, while diminish with positive abstract nouns.

Keywords

1. Introduction

Vocabulary is vital and indispensable to language learning. As English linguist D. A. Wilkin (1972) argues that, "Vocabulary is more important than grammar, because without the vocabulary, people can not express anything, and without grammar, it just limits expression". However, English vocabulary is very large, and the number of synonyms account for more than 60% of the total vocabulary (Wang, 2012). As for synonyms, although semantically overlapping, they have finely distinguished meanings and are not completely substitutes for each other (Edmonds and Hirst, 2002). Furthermore, the reasonable selection and use of synonyms can make communication accurate and effective, and synonyms are also challenging for language learners. Even native English speakers cannot select and use synonyms very well. According to Liu (2018) has suggested that there are 18 words in English meaning "beautiful", 21 words for "beginning", and 28 words for "pure". Although a large number of English dictionaries at home and abroad have a certain guiding role for learners, in most cases, due to the limited space of dictionaries, most of them can only provide general information, which cannot help learners better distinguish and select synonyms (Harvey and Yuill, 1997). What's more, in traditional vocabulary teaching, when explaining an infrequently used word, teachers often turn to synonyms and use commonly used synonyms to better explain its meaning and usage, which makes it difficult for learners to distinguish and master synonyms. Therefore, synonyms deserve special attention. As the advancement of computer technology and the emergence of corpus linguistics, to enhance research reliability, the authentic data based on corpus as an effective tool are used for synonyms recognition, and identify synonym usage, which has offered credible evidence for lexical semantic theory that the meaning of a word is primarily determined by its collocations and context (Firth 1957; Sinclair 1966). This scientific and

objective analysis method can clearly reveal the subtle semantic differences between synonyms. So far, there have been many corpus-based studies on English synonymous verbs (Hanks, 1996; Arppe, 2008; Zheng, 2018) and synonymous adjectives (Gries 2001; Liu 2010; Tao, 2019). Therefore, based on Corpus of Contemporary American English (COCA), the present paper conducts a research on a group of synonymous verbs (reduce & diminish) from three aspects: word frequency, collocation and semantic prosody.

2. Literature Review

2.1. Related Corpus-based Studies on Synonyms Abroad

In the early 1960s, Francis and Kucera began to design and build the first large-scale corpus-the Brown Corpus (BROWN). Foreign research on corpus linguistics has undergone several years of development and has achieved fruitful research results (Wang, 2014). On the basis of a corpus of native speakers, Partington (1998) studied a group of verbal synonyms"look", "see" and "watch", and found that learners can rely on their linguistic competence and corpus to learn synonyms effectively, and Kennedy (1991) analyzed prepositional synonyms "between" and "through", and the results show that their collocations are different and cannot be converted to each other. Moreover, in Hoey (2005), it studied the difference between "result" and "consequence", and found that consequence easily triggers negative semantic prosody, while result more often triggers positive semantic prosody. Based on this, he believes that the difference between synonyms mainly depends on their collocation with other words, grammatical and semantic connections. Indeed, his research has made huge progress in this field. Furthermore, from the perspective of cross-cultural linguistics, the characteristics of synonyms in collocation behavior and semantic prosody are discussed (Richard & Tony, 2006). They selected the English corpus Flob/Frown and Chinese corpus PDC2000 (Corpus for Chinese), and two sets of English synonyms (result /outcome /consequence/aftermath) and (price/cost/expense). The research results show that there are significant differences between the two in terms of collocation and semantic prosody in terms of English corpus and Chinese corpus. In addition, Gunther and Barbara (2005) argue that the application of corpus in language teaching is still neglected, and the practical application of corpus in English classroom is relatively rare. Thus, it is very important for teachers and students to distinguish and master the differences between synonyms with the aid of corpus.

2.2. Related Corpus-based Studies on Synonyms at Home

In China, many scholars have also studied synonyms based on corpus. Pan and Feng (2000) first proposes that the recognition of English synonyms based on corpus can be achieved by searching statistical data, finding word frequency, observing their collocations, and revealing their semantic differences. Based on this finding, Leng (2015) further compares and analyzes the differences of two adjective synonyms (competent and capable) in word frequency, collocation, and class connection through Corpus of Contemporary American English. It found that "capable" is much more frequent than "competent". Capable is usually used to describe a person, while competent can not only be used to decorate people, but also show certain ability. Moreover, Wang (2016) chooses COCA to identify a group of verb synonyms (arouse, provoke and evoke), and verifies that they are quite different in terms of register distribution, class connection, collocation, semantic preference and semantic prosody. For example, the semantic prosody of arouse is mixed, while the semantic prosody of provoke is negative. And for adverb synonyms, a comparative analysis of a set of adverb synonyms (totally, completely, essentially and absolutely) was studied by Jin (2018), which finds that these four synonyms have different register distribution, collocation and semantic prosody. For example, it can be seen that absolutely is the most frequently used word in spoken English. However, the other three are commonly used in magazines, academic journals and other formal written languages.

3. Research Problems

Based on the study of synonyms at home and abroad, there are more synonym research on nouns and less on verbs, especially the commonly used verb synonyms. Besides, most studies only focus on one or several aspects of synonyms in frequency distribution, collocation, colligation and semantic prosody, and few researches pay attention to these four aspects at the same time.

Therefore, against this backdrop, the present study aims to answer the following two questions:

What are the differences among native English speakers in the use of the group of synonyms (reduce & diminish) in terms of word frequency distribution, colligation, collocation and semantic prosody?

(2) What are the implications for English vocabulary teaching and dictionary compilation based on the corpus-based study of verb synonyms?

4. Research Design

4.1. Research Tool

The present research uses the Corpus of Contemporary American English (COCA), which is currently the world's largest online free English corpus, including eight types of corpus, that is,spoken language, novels, popular magazines, newspapers, academic texts, TV and movie subtitles, blogs and other web pages. Its vocabulary is as much as 1 billion, and 20 million new words are added every year. Therefore, its authentic and rich corpus and convenient operation provide convenience for this research.

4.2. Research Methodology

Zhang (2005) proposed a corpus-based approach to synonym discrimination: to observe the distribution frequency of synonyms in different registers, to observe collocation features, to statistically analyze the semantic prosody and colligation of synonyms. Therefore, the current quasi-experimental research also adopts this method.

4.3. Choice of Synonyms

First of all, through the search for synonyms in the COCA corpus, enter [=diminish] in the search box of the LIST interface to get all the synonyms of diminish arranged by frequency, among which the synonym with the highest frequency is reduce.

HELP		ALL FORMS (SAMPLE) : 100 200 500	FREQ	TOTAL 167,505 | UNIQUE 10 +
1	.	REDUCE [S]	58972	
2	.	CONTRACT [S]	55663	
3	.	MODERATE [S]	23361	
4	.	FADE [S]	8144	
5	.	SHRINK [S]	7234	
6	.	DIMINISH [S]	5037	
7	.	WEAKEN [S]	3971	
8	.	LESSEN [S]	2772	
9	.	EBB [S]	1467	
10	.	TAPER [S]	884	
		TOTAL	167505	

Secondly, according to the definition of diminish and reduce in Longman Dictionary of Contemporary English 5th Edition:

Reduce: v.

1. To make something smaller or less in size, amount, price

2. If you reduce a liquid, or if it reduces, you boil it so that there is less of it

3. To become thinner by losing weight

Diminish: v.

1. To become or make something become smaller or less

2. To deliberately make someone or something appear less important or valuable than they really are

Based on the above definitions, it must be admitted that the Longman Dictionary has a very high degree of interpretation of word meanings, and learners can have a good grasp of reduce or diminish based on these prompts; however, it is difficult to select the set of synonyms only based on dictionary definitions, when two words are used to express the meaning of "something is reduced in certain aspects", namely:

To make something smaller or less in size, amount, price （from reduce）

To become or make something become smaller or less （from diminish）

According to the above, based on the COCA corpus, the most frequent synonym of diminish is reduce, and the two belong to a group of high-frequency synonyms, and it is difficult for students to distinguish them only based on dictionary definition. Therefore, more data need to be collected and analyzed, in order to help learners better grasp and distinguish this pair of synonyms.

5. Data Collection and Analysis

5.1. Frequency Analysis

First, the author selects the LIST retrieval method in the COCA corpus, and enters [reduce] and [diminish] respectively to obtain the total frequency (including the original form of verbs, the past tense, the third-person singular form, etc.), the results are shown in tables 1 and 2:

Table 1. The frequency of the verb reduce in COCA

HELP	ALL FORMS :	FREQ	
1	REDUCE	58963	
2	REDUCED	30192	
3.	REDUCING	22323	
4	REDUCES	8916	
	TOTAL	120394	

Table 2. The frequency of the verb diminish in COCA

HELP	ALL FORMS :	FREQ	
1	DIMINISHED	5541	
2	DIMINISH	5032	
3	DIMINISHES	1689	
4	DIMINISHING	1408	
	TOTAL	13670	

According to Table 1 and Table 2, we can see that the total frequency of reduce is 120,394, and the total frequency of diminish is 13,670. Therefore, reduce is the most commonly used in English, while diminish is used relatively rarely; in addition, two words mostly appear in the original verb form and -ed form. Although the specific usage differences of this group of verb synonyms cannot be exactly known through word frequency, it can be learned that if we want to express the meaning of reduction in English learning, we should use reduce more.

5.2. Register Distribution

Register refers to the variety of speech produced in actual language activities for the needs of communication, or because of the different situations, objects, and topics in discourse, which is reflected in different styles of language. Therefore, because of the differences in their internal meanings, synonyms tend to show different distribution features in different registers, and general dictionaries do not involve the register distribution of words, therefore, a corpus-based analysis of the register distribution of words will help to distinguish them (Yang, 2013). This article selects a group of synonymous verbs: reduce and diminish, and counts their frequency in eight registers, including conversation, novel, news, and academic articles, etc.. First, enter reduce and diminish in the "chart" column to get the frequency distribution of this group of synonymous verbs in the eight registers and different time periods. The results are shown in Table 3 and Table 4:

Table 3. Frequency distribution of reduce in different registers and time periods

SECTION (CLICK FOR SUB-SECTIONS)	FREQ	SIZE (M)	PER MIL	CLICK FOR CONTEXT
BLOG	7,965	128.6	61.93	
WEB-GENL	8,692	124.3	69.95	
TV/MOVIES	646	128.1	5.04	
SPOKEN	4,541	126.1	36.00	
FICTION	602	118.3	5.09	
MAGAZINE	13,395	126.1	106.23	
NEWSPAPER	8,719	121.7	71.62	
ACADEMIC	14,410	119.8	120.29	
1990-1994	7,202	139.1	51.79	
1995-1999	7,385	147.8	49.97	
2000-2004	7,192	146.6	49.07	
2005-2009	7,424	144.9	51.22	
2010-2014	7,471	145.3	51.43	
2015-2019	5,639	144.7	38.96	
TOTAL	50,641			

Table 4. Frequency distribution of reduce in different registers and time periods

SECTION (CLICK FOR SUB-SECTIONS)	FREQ	SIZE (M)	PER MIL	CLICK FOR CONTEXT
BLOG	727	128.6	5.65	
WEB-GENL	746	124.3	6.00	
TV/MOVIES	127	128.1	0.99	
SPOKEN	499	126.1	3.96	
FICTION	310	118.3	2.62	
MAGAZINE	819	126.1	6.50	
NEWSPAPER	600	121.7	4.93	
ACADEMIC	1,207	119.8	10.08	
1990-1994	716	139.1	5.15	
1995-1999	644	147.8	4.36	
2000-2004	579	146.6	3.95	
2005-2009	597	144.9	4.12	
2010-2014	501	145.3	3.45	
2015-2019	525	144.7	3.63	
TOTAL	4,298			

As shown in Table 3 and Table 4, reduce is used more frequently than diminish in each phase from 1990 to 2019, and the ratio of both was 10:1 in each phase, which indicates that native English speakers are more likely to use reduce to express reduction. Secondly, in recent years, the frequency of reduce has been decreasing significantly, while that of diminish has been relatively stable.

In addition, both appear more in academic articles and less in movies, TV shows and novels, which can be seen that both occur much less frequently in spoken language than in written language, that is,these two words occur more frequently in formal texts, and have obvious academic characteristics.

Furthermore, as shown in Table 5, the ratio of diminish and reduce in the novel register is about 1:2, which shows that the two words are most similar in this kind of register; in the TV and movie register, the ratio is about 1:5; in the remaining six registers, the ratio is about 1:10. Therefore, it is concluded that the frequency of diminish and reduce is the closest in the novel domain, while the frequency is quite different in blogs, web pages, spoken language, academics, magazines and newspapers.

Table 5. The proportions of diminish and reduce in different registers

node word	BLOG	WEB-GENL	TV/MOVIES	SPOKEN	FICTION	MAGAZINE	NEWSPAPER	ACADEMIC
diminish	727	746	127	499	310	819	600	1207
reduce	7965	8692	646	4541	602	13395	8719	14410
proportion	9%	9%	20%	11%	51%	6%	7%	8%

5.3. Colligation of Reduce and Diminish in the COCA Corpus

The emergence of vocabulary is not arbitrary, and is restricted by both colligation and collocation. Collocation is the concrete embodiment of class connection. Because reduce and diminish occur more frequently, 50 records randomly selected in the COCA corpus were summarized and their percentages were calculated (see Table 6).

Table 6. Colligation of reduce and diminish in COCA

Reduce	Frequency	Ratio	Diminish	Frequency	Ratio
reduce+N	47	94%	diminish+N	38	76%
be reduced by/from	3	6%	be diminished by	5	10%
			sth. diminish(vi.)	9	18%

According to Table 6, it is clear that reduce and diminish have similarities and differences in class connection. First of all, the verb reduce has two main types of colligation, while diminish has three. Secondly, reduce and diminish are more commonly used in the colligation "V+N", with the proportions of 94% and 76% respectively, and the two are used in passive structures less frequently. Therefore, we can know that diminish can be used as an intransitive verb when expressing the reduction of something, which reduce does not have, and the two are more commonly used in the active voice, especially in the structure of "V+N".

5.4. Collocations of Reduce and Diminish in COCA Corpus

Firth once said, "You shall know a word by the company it keeps". The components of collocations will define, anticipate and foresee each other, and what collocation reveals is the typicality and idiomatic use of language. Therefore, a good command of collocations is helpful for English learners to choose authentic and appropriate words and avoid ambiguity. And according to Table 6, it can be known that the two are more commonly used in the active voice, especially in the structure of "V+N". Therefore, this paper focuses on the differences of noun collocations after reduce and diminish.

First, select the "Collocates" option in the COCA corpus interface, set reduce and diminish as node words in turn and their part of speech to verbs, and set the part of speech of their collocation words to nouns, that is, select noun.ALL in the "POS LIST" option. Then, set the span to (0,+4), select RELEVANCE and MUT INFO , and set FREQUENCY>10. Finally, observe the salient noun collocations on the right side of reduce and diminish, and due to space limitations, this article just takes the top 20 data and draws Table 7 and Table 8:

As can be seen from Table 7, puffiness is the strongest collocation with reduce, and the noun collocations with reduce can be grouped into the following four categories:

1) Abstract nouns denoting for environment, pollution, emission: such as emission, greenhouse, heat, pollution, etc.;

2) Abstract nouns for disease, pain, inflammation: such as puffiness, inflammation, homocysteine, soreness, morbidity, incidence, etc.;

3) Abstract nouns for dependence, disparity: such as dependence, reliability, disparity, etc.;

4) Abstract nouns for economy, weapons, and transportation: such as defense, backlog, congestion, arsenal, etc.

Table 7. Noun collocations of reduce in COCA corpus

HELP			FREQ	ALL	%	MI	
1		PUFFINESS	19	178	10.67	8.81	
2		EMISSIONS	1643	19314	8.51	8.48	
3		RECIDIVISM	73	901	8.10	8.41	
4		BYCATCH	27	502	5.38	7.82	
5		DEPENDENCE	366	7819	4.68	7.62	
6		GREENHOUSE	469	10455	4.49	7.56	
7		FOOTPRINT	150	3567	4.21	7.47	
8		INFLAMMATION	223	5316	4.19	7.46	
9		ARSENALS	32	769	4.16	7.45	
10		DEFICIT	1125	27192	4.14	7.44	
11		BACKLOGS	10	247	4.05	7.41	
12		CONGESTION	153	3789	4.04	7.41	
13		HOMOCYSTEINE	13	383	3.39	7.16	
14		HEAT	2961	87877	3.37	7.15	
15		POLLUTION	567	19195	2.95	6.96	
16		RELIANCE	179	6108	2.93	6.95	
17		INCIDENCE	244	8355	2.92	6.94	
18		DISPARITIES	95	3423	2.78	6.87	
19		MORBIDITY	53	1935	2.74	6.85	
20		SORENESS	21	785	2.68	6.82	

It can be seen from Table 8 that stature is the strongest collocation with diminish. At the same time, according to statistics, the top20 noun collocations of the keyword diminish can be roughly divided into the following three categories:

1) Abstract nouns denoted for influence, effect, value, importance: such as importance, significance, value, impact, influence, role, etc.;

2) Abstract nouns for credibility, possibility, prospects, opportunities: such as chances, likelihood, prospects, credibility, etc.;

3) Abstract nouns for status, prestige, achievement, ability: such as stature, prestige, achievement, dignity, reputation, ability, capacity, effectiveness, etc.

Table 8. Noun collocations of diminish in COCA corpus

HELP	.	.	FREQ	ALL	%	MI	
1	.	STATURE	21	4080	0.51	7.99	
2	.	PRESTIGE	10	5288	0.19	6.54	
3	.	EFFECTIVENESS	33	17585	0.19	6.53	
4	.	IMPORTANCE	90	51425	0.18	6.43	
5	.	ACCOMPLISHMENTS	12	7534	0.16	6.30	
6	.	CREDIBILITY	19	14946	0.13	5.97	
7	.	SIGNIFICANCE	25	21835	0.11	5.82	
8	.	CHANCES	31	28893	0.11	5.73	
9	.	LIKELIHOOD	14	13973	0.10	5.63	
10	.	DIGNITY	13	14262	0.09	5.49	
11	.	PROSPECTS	10	13833	0.07	5.16	
12	.	CAPACITY	30	41850	0.07	5.14	
13	.	VALUE	89	125649	0.07	5.13	
14	.	IMPACT	50	96335	0.05	4.68	
15	.	QUALITY	54	106366	0.05	4.65	
16	.	INFLUENCE	36	71641	0.05	4.63	
17	.	ABILITY	53	107144	0.05	4.61	
18	.	REPUTATION	11	28062	0.04	4.27	
19	.	ROLE	55	155929	0.04	4.12	
20	.	VALUES	26	77003	0.03	4.06	

From the above statistics, we find that although the two can be followed directly by nouns, especially abstract nouns, the characteristics of their noun collocations are different. More specifically, reduce is commonly collocated with abstract nouns related to environment, disease, disparity, economy, transportation, etc, while the abstract nouns collocated with diminish are mostly related to importance, prospect, possibility, and achievement.

5.5.   Semantic Prosody of Reduce and Diminish in the COCA Corpus

Semantic prosody is another effective method to distinguish synonyms, and can be roughly divided into three categories: positive prosody, neutral prosody and negative prosody. In the following, the author will describe the semantic prosody of this group of synonyms through their salient collocations collected above. Through analysis, in the COCA, although the two words tend to be combined with words with neutral semantic prosody, they are different. In most cases, reduce is combined with words with neutral semantic prosody, such as economy, transportation, and environment. In addition, it is sometimes combined with words with negative semantic prosody, such as pollution,inflammation, incidence. What's more, the semantic prosody of diminish is mainly positive, such as prestige, prospect, value and so on. Additionally, it also includes a small number of neutral semantic prosody, such as possibility, influence, likelihood. Therefore, it can be known that reduce is more commonly collocated with negative nouns, while diminish with positive nouns.

6. Major Findings and Implications

The present research is based on a comparative study of two synonymous verbs (reduce & diminish) in the COCA corpus with reliable and authentic data. The main findings of this study are as follows:

Firstly, in terms of frequency, English native speakers tend to use reduce to express the reduction of something, and diminish is used less frequently. However, in recent years, the frequency of reduce has been decreasing significantly, while that of diminish has been relatively stable. What's more, the both are frequently used in academic register or formal texts.Then, in terms of collocation, these two verbs are more commonly collocated with nouns. However, diminish can be used as an intransitive verb, but reduce can't. Furthermore, although the two can be followed by abstract nouns, reduce is more commonly collocated with negative nouns, while diminish with positive nouns.

The enlightenment of this research on English vocabulary teaching and dictionary compilation is as follows:

First, by searching the corpus of native speakers, learners can observe the characteristics of the vocabulary used by native speakers, such as typical collocations, colligations and semantic prosody. The corpus of native English speakers has a wealth of authentic corpus, which can be used as a source of English test database. Furthermore, using corpus for vocabulary exploration should also be widely used as a powerful teaching aid to distinguish synonyms, which will make vocabulary teaching more dynamic and convincing. Finally, by retrieving the usage of target words in the corpus, more intuitive and reliable discrimination results can be obtained. The collocation and semantic prosody based on corpus data analysis can provide learners with detailed information about word collocation and semantic prosody. Therefore, through corpus-based research, we can provide more detailed and useful information for the future dictionary compilation.

7. Disclosure Statement

The author declares that there is no conflict of interest.

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