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Distinguishing the near-synonyms 'increase' and 'rise': Genre and collocation investigation

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Abstract

Mastering the use of near-synonyms is often considered a daunting challenge for English learners. Although some synonyms in English are very semantically close, they cannot always be used interchangeably in all contexts. This corpus-based study aims at analyzing the genres and collocations of two synonymous verbs *increase* and *rise* found in American English through the Corpus of Contemporary American English (COCA). The findings demonstrate that both synonyms are common in formal written genres, with *increase* and *rise* being most frequent in academic texts and popular magazines respectively. While the target synonyms share most of the adverb collocates, both seem to differ clearly in the nouns with which they collocate. The meaning 'go upward' of *rise* in combination with nouns describing a direction of a natural entity, as in *the moon, the sun*, or *the sea*, distinguishes its usage from *increase*.

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Introduction

English synonyms are difficult for EFL (English as a Foreign Language) learners to distinguish in a clear manner due to their similarities in meaning. Very often some students try replacing a word with its synonym to enhance a variety of word choice in their writing. Such lexical creativity can sometimes result in unnatural English use (Thornbury, 2002) since not all synonyms are substitutable in every context of use (Crawford & Csomay, 2016). Though their core meanings overlap, synonyms differ in several aspects, such as dialects, degree of formality, connotations, collocations, and grammatical patterns (Jackson & Amvela, 2007). Learners with little awareness of such differences may face difficulty in their word selection as improper words may lead to unacceptable L2 English production.

The study investigated two high-frequency synonymous verbs *increase* and *rise*, focusing on their distribution across genres and collocations. They were selected as the target synonyms because the two verbs are included in the first 1000 most frequent words in written English and occur between 1,000 and 2,000 words in spoken English (Pearson Education, 2014). Their definitions are provided below:

increase [I,T] if you increase something, it becomes bigger in amount, number, or degree (Pearson Education, 2014, p. 934)

rise [I] to increase in number, amount, or value (Pearson Education, 2014, p. 1572)

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The dictionary also provides some adverbs that frequently collocate with both verbs. However, no information on noun collocates of the two verbs is officially listed. Due to the limited space in dictionaries, not all collocations that frequently appear with a word can be displayed. In other words, corpus information regarding collocations outweighs that available in dictionaries since the data from the former source is based on a great amount of authentic English. Recent studies on synonyms have also pointed out the benefits of seeking information from native-speaker corpora in making generalizations on the different usages of synonyms (e.g. Aroonmanakun, 2015; Crawford & Csomay, 2016; Petcharat & Phoocharoensil, 2017). Consequently, the present corpus-based study aims to discover the subtle differences in genres and collocations between *increase* and *rise*, using data from the Corpus of Contemporary American English (COCA), a huge corpus of general American English consisting of over one billion words (Davies, 2020).

Corpus-based Studies on Synonyms

A number of corpus-based studies investigated synonyms in English to find similarities and, more importantly, differences between them. It is clear that data from language corpora can provide new insights that are not available in learner dictionaries (Aroonmanakun, 2015). In other words, the subtle differences lying between near-synonyms are identifiable through corpus-informed evidence, as opposed to sole reliance on native speakers' intuition or dictionaries.

Benefits of corpora over learner dictionaries were also confirmed by Petcharat and Phoocharoensil (2017) in their study of the synonymous adjectives *appropriate, proper*, and *suitable*. The researchers pinpointed usage differences between these synonyms by comparing the information from three learner dictionaries with data from the Corpus of Contemporary English (COCA). It was revealed that *appropriate* is the most common in formal genres, followed by *suitable* and *proper* respectively. It is noteworthy that *proper* has the widest variety of noun collocates probably because it has more senses of meaning than the other two synonyms. Furthermore, *appropriate* and *suitable* have more various grammatical patterns than *proper*, some of which are not existent in the consulted dictionaries.

Collocation is one of the main criteria used in differentiating the adjective synonyms *quick* and *fast* in Aroonmanakun's (2015) study. The common noun collocates with the MI score of at least three, the level of statistical significance of collocational strength, were retrieved from COCA. It was revealed that the nouns that often appear with *quick* describe an action having been done in a short period of time, e.g. *answer, breakfast, comment, reaction, reference, solution*, whereas most of the noun collocates of *fast* exhibit the manner of movement rather than a short period of time, e.g. *acceleration, attack*, *boat, car, ride,* and *tempo*. In comparing the verbs *learn* and *acquire*, Yang (2016) employed the Sketch Engine (SkE) on the BNC corpus to investigate the dominant left and right collocates of the two verbs. It was found that while the object patterns were similarly found to collocate with both *learn* and *acquire*, the modifier patterns were found to collocate more significantly with *learn* than with *acquire.* The dominant left collocates of both *learn* and *acquire* were similar in terms of abstract nouns and individual/collective nouns. However, the left dominant patterns of *learn* also included personal pronouns and auxiliary and modal verbs, whereas adverbs were also found to collocate with *acquire*. In terms of the right dominant, abstract nouns and notional verbs, such as *read, live, cope*, were found to collocate with *learn,* while only abstract nouns and individual/collective nouns collocated with *acquire.* In a similar vein, Gu (2017), investigating the differences between the synonyms *obtain* and *gain* in the BNC corpus in terms of colligation, collocation and semantic prosody, revealed that the passive pattern with preposition was a common colligation for *obtain*. Nouns were dominantly found to collocate with *obtain* to mean methods or the relevance of law and business, while abstract nouns were significantly found to collocate with *gain*. Overall, the researcher found *gain* to have positive semantic prosody, whereas neutral and mixed semantic prosody were found in *obtain.*

From the reviewed studies, it can be concluded that corpus-based approaches in investigating synonyms can yield richer results in terms of colligation, collocation, distribution patterns, formality, and semantic preference/prosody. Still, there seem to be little or no corpus-based research investigating the similarities and differences between the synonymous verbs *increase* and *rise*. This study therefore aimed to investigate the two synonyms in response to the research questions below:

1. How are the synonyms *increase* and *rise* distributed across different genres?

2. What are the common collocations of the synonyms *increase* and *rise*?

Methodology

The Corpus of Contemporary American English (COCA), a very large, genre-balanced corpus of American English, was the source of the data for this study. COCA is considered one of the most well-known English corpora for ELT research and practice, containing more than one billion words of text, approximately 20 million words being added annually from 1990–2019. Currently, COCA encompasses texts of eight genres, namely five fundamental genres, i.e. spoken, fiction, popular magazines, newspapers, and academic texts, plus three new genres, i.e. TV and Movie subtitles, blogs, and webpages.

For the present study, frequencies and distribution patterns of the target synonyms, i.e. *increase* and *rise*, in all of the eight different genres of COCA, were first explored in order to answer the first research question. As mentioned earlier, the two verbs were selected for the study because they are among the first 1,000 words with the highest frequency in written English and occur between 1,000 and 2,000 words in spoken English (Pearson Education, 2014). In response to the second research question, nouns and adverbs frequently collocating with the target synonyms were searched for in COCA. The statistics applied in collocational strength measurement for this study was the Mutual Information (MI) value or score, provided by COCA, which figures out whether two words co-occur by chance or have a strong association in terms of collocation. Nonetheless, there is likelihood that rare occurrences will be identified as common collocates of the search word in the MI list. This means certain collocations with high MI scores are not always the most representative examples due to the fact that their total occurrences in a corpus can be very low (Szudarski, 2018). In looking for common collocations, it is highly recommended that the MI score be used in combination with frequency (Schmitt, 2010). For this reason, the collocational strength was measured in this study by using both frequency and the MI value as presented in COCA. The nouns and adverbs accompanying the target verbs that are in the top-30 frequency list demonstrated in COCA and MI score of which is ≥ 3, i.e. the significance value for collocational association, were considered to be common collocates (Cheng, 2012).

Results and Discussion

Frequency and Distribution of the Synonyms across Genres

Table 1 shows that the overall frequency of *increase* (96,546 tokens or 115.7 w/m) is higher than that of *rise* (57,848 tokens or 67.71 w/m). The verb *increase* is the most frequent in academic texts (33,026 tokens or 275.7 w/m), followed by webpages (19,034 tokens or 153.19 w/m) and blogs (17,651 tokens or 137.24 w/m), respectively. The frequency of *rise* is highest in magazines (12,431 tokens or 98.59 w/m), followed by academic texts (10,471 tokens or 87.41 w/m), while their occurrences in webpages (9,837 tokens or 79.17 w/m) and newspapers (9,486 tokens or 77.92 w/m) are close.

The target synonyms are associated with formal genres as their high frequency is noticed in academic texts. The verb *rise* may be slightly less formal than *increase* since the former occurs with the highest frequency in popular magazines. It is probable that the language that columnists use in writing scripts for magazines involves current trend description, which may explain why the word *rise* has its greatest occurrences in this genre. It is evident that both synonyms are uncommon

Table 1 Distribution of the Synonyms *Increase* and *Rise* across Eight Genres according to Frequency

Genre	Total words in COCA (million)	Increase		Rise	
		Frequency	Per million	Frequency	Per million
academic texts	119.8	33,026	275.70	10,471	87.41
webpages	124.3	19,034	153.19	9,837	79.17
blogs	128.6	17,651	137.24	8,939	69.50
newspapers	121.7	16,406	134.76	9,486	77.92
magazines	126.1	16,353	129.69	12,431	98.59
spoken	126.1	9,476	75.13	5,434	43.08
TV and movie subtitles	128.1	1,774	13.85	3,893	30.40
fiction	118.3	1,169	9.88	6,745	57.01
Total	993	96,546	115.70	57,848	67.71

in informal English as they share the same three genres in which they appear with the lowest frequency, i.e. spoken language, TV and movie subtitles, and fiction, with *increase* being least frequent in fiction (1,169 tokens or 9.88 w/m) and *rise* in TV and movie subtitles (3,893 tokens or 30.40 w/m).

It is noteworthy that although the two synonyms have a high degree of formality, they seem to be characteristic of different text types. Given their highest frequency, *increase* is apparently closely related to academic English, while *rise* essentially characterizes English in magazines. Such a different distribution of *increase* and *rise* across genres in COCA lend support to previous studies in that some synonyms are different in the style or formality of the contexts in which they are used.

The following section deals with an analysis of the common noun and adverb collocates of the synonyms *increase* and *rise*, addressing the second research question.

Common Collocation Analysis

Adverb collocates

From Table 2, adverbs that commonly appear with the verbs *increase* and *rise*, based on the top-30 frequency and MI scores (≥ 3), are presented. It is remarkable that the number of the most frequent adverb collocates of *increase*, i.e. *significantly* (2,179 tokens), is almost three times higher than that of rise, i.e. *slowly* (771 tokens). With closer scrutiny, many adverbs co-occurring with the two synonyms overlap, e.g. *dramatically, substantially*, as well as those adverbs ending with *-fold*, e.g. *fivefold*. That fact that both verbs share a number of synonyms evidently supports their synonymy; words with similar meaning tend to have collocates in common (Szudarski, 2018).

Careful interpretation of the collocational information shown in Table 2 is required. Some adverbs can probably be used with both *increase* and *rise* but are not listed in Table 2 due to low frequency or a low MI score in COCA. For instance, *slightly*, as demonstrated in COCA, can actually be combined with both target synonyms but does not seem to meet the selection criteria of the study since its MI score as a collocate of *increase* (2.98) and of *rise* (2.85) is lower than 3, despite the high frequency as a co-occurring partner of *increase* (497 tokens) and *rise* (376 tokens).

In the next step, the adverb collocates of *increase* and *rise* were categorized based on their semantic properties. Information from the list of collocations, as reported in Table 2, allows for identification of the range of lexical item associations as well as the meaning relations among collocates (Cheng, 2012; Crawford & Csomay, 2016).

An analysis of the semantic preference of *increase* reveals five major themes, shown in Table 3. The majority of the adverb collocates belong to HIGH SPEED and/or AMOUNT as they primarily indicate that an increase happens 'in a very sudden or noticeable way', e.g. *dramatically,* or 'to a large, noticeable, or important degree', e.g. *considerably*. Closely related to the first theme is LOW SPEED and/or AMOUNT, which encompasses adverbs exhibiting slow increase, e.g. *gradually*, or an increase of slight amount, e.g. *incrementally*.

Below are some COCA examples of common adverbs collocating with *increase* from different themes:

1. Demand for physician assistants is expected to *increase dramatically*, by 37.4 percent by 2026, creating 39,700 new jobs (HIGH SPEED and/or AMOUNT).

2. Thus, environmental protection expenditures as a percent of GDP will continue to *increase gradually*, reaching 2.9 percent of GDP in 1995, 3.1 percent in 2000 (LOW SPEED and/or AMOUNT).

As demonstrated in Table 4, four themes of the adverb collocates of *rise* overlap with those of *increase*, namely HIGH SPEED and/or AMOUNT, LOW SPEED and/or AMOUNT, CONTINUITY, and TIME. Like the adverbs collocating with *increase*, the majority of the adverb collocates of *rise* describes the way an increase occurs 'quickly and suddenly', e.g. *abruptly* or 'by a very large amount', e.g. *substantially*, or 'suddenly or by a large amount', e.g. *steeply*. COCA examples of adverb collocates of *rise* from different themes are provided in 3–4:

3. Therefore, stock prices will not *rise significantly* until foreign investors (mostly US) see an end to this world growth (HIGH SPEED and/or AMOUNT).

4. If it causes the temperature to *rise slowly*, the battery can melt, and the liquid inside can leak out (LOW SPEED and/or AMOUNT).

Noun collocates

An exploration of nouns that frequently collocate with the two synonymous verbs yielded interesting results regarding the positions in which the nouns can appear. As *rise* is an intransitive verb, it does not require any object. Accordingly, all the noun collocates shown in Table 5, which presents the top-30 frequency and MI scores (≥ 3), precede *rise*. In contrast, *increase* can be a transitive or intransitive verb.

Table 2 Adverb Collocates of *rise* and *increase* from COCA

Increase			Rise		
Word	Frequency	MI-Scores	Word	Frequency	MI-Scores
significantly	2,179	5.39	slowly	771	3.72
dramatically	1,825	6.56	rapidly	707	4.93
greatly	1,125	5.64	steadily	664	6.26
substantially	795	5.97	sharply	597	5.78
steadily	719	6.09	above	557	3.28
gradually	670	4.97	dramatically	487	4.94
rapidly	656	4.54	gradually	166	3.24
exponentially	451	7.36	steeply	126	7.16
sharply	353	4.80	substantially	104	3.32
vastly	202	4.92	abruptly	99	3.74
considerably	178	3.92	exponentially	91	5.34
markedly	162	5.71	swiftly	65	3.83
tenfold	161	8.06	modestly	56	4.87
annually	153	3.43	unsteadily	55	6.94
drastically	135	4.65	upward	44	3.00
_fivefold	109	8.31	stiffly	42	5.03
linearly	88	7.02	majestically	41	7.08
enormously	80	4.04	precipitously	37	5.76
tremendously	79	4.14	vertically	33	3.96
progressively	79	4.60	markedly	29	3.51
massively	71	4.77	inexorably	28	4.76
_ threefold	50	6.99	skyward	28	4.92
_sixfold	45	8.46	gracefully	25	3.34
proportionally	44	5.78	shakily	17	5.55
modestly	43	4.21	_tenfold	16	4.99
monotonically	43	8.41	_fivefold	13	5.53
incrementally	41	5.35	alarmingly	12	3.90
marginally	39	3.99	astronomically	11	5.32
moderately	38	3.09	rhythmically	8	3.71
artificially	36	3.43	appreciably	7	3.72

Table 3 Semantic Preference of Adverb Collocates of *Increase*

Semantic Preference	Adverb Collocates of *Increase*
1. HIGH SPEED and/or AMOUNT	considerably, dramatically, drastically, enormously, exponentially, greatly, markedly, massively, rapidly, sharply, significantly, substantially, tremendously, vastly
2. LOW SPEED and/or AMOUNT	gradually, incrementally, marginally, modestly, monotonically
3. CONTINUITY	annually, linearly, progressively, steadily
4. TIME	fivefold, sixfold, tenfold, threefold
5. MISCELLANEOUS	artificially, moderately, proportionally

Table 4 Semantic Preference of Adverb Collocates of *Rise*

Semantic Preference	Adverb Collocates of *Rise*
1. HIGH SPEED and/or AMOUNT	abruptly, alarmingly, appreciably, astronomically, dramatically, exponentially, markedly, majestically, precipitously, rapidly, sharply, steeply, stiffly, substantially, swiftly, vertically
2. LOW SPEED and/or AMOUNT	gracefully, gradually, modestly, slowly
3. CONTINUITY	inexorably, rhythmically, shakily, steadily, unsteadily
4. DIRECTION	above, skyward, upward
5. TIME	fivefold, tenfold

Table 5 Noun Collocates of *increase* and *rise* from COCA

Increase			Rise		
Word	Frequency	Scores	Word	Frequency	Scores
_number	5683	3.44	price	4409	4.67
_ percent	4339	3.43	level	3057	3.53
rate	3987	4.13	rate	2696	6.26
_risk	3750	4.49	sun	2250	4.47
tax	3680	3.91	cost	1968	3.66
level	2561	3.00	temperature	1722	4.93
cost	2109	3.48	sea	1453	4.10
price	2027	3.28	stock	929	3.37
_chance	1834	3.08	income	898	3.48
_amount	1752	3.58	unemployment	766	4.97
_size	1636	3.62	smoke	744	4.63
_production	1605	3.92	moon	664	3.60
_likelihood	1485	6.55	sales	627	3.21
population _	1369	3.16	inflation	555	4.76
revenue	1318	4.48	revenue	530	3.45
pressure	1234	3.35	wage	526	4.08
sales	1119	3.78	steam	458	4.97
spending	1050	4.49	tension	434	3.88
income	1036	3.40	Nasdaq	423	9.90
_speed	1030	3.79	profit	406	3.15
_efficiency	1000	5.27	cloud	375	3.04
temperature	960	3.81	Judd	316	11.51
_capacity	909	4.13	earnings	304	4.05
demand	895	3.63	index	295	3.41
_productivity	871	5.71	tide	289	4.31
_awareness	803	4.60	toll	271	4.52
debt	795	3.25	dust	262	5.21
_profit	740	3.75	mist	228	5.10
wage	700	4.21	consumption	209	3.24
_share	691	3.17	dawn	203	3.88

From Table 6, the noun collocates under MONEY account for approximately one-third of the top-30 collocates found in COCA. Most of the nouns can be either subject nouns or object nouns, i.e. *cost.* Only two occupy the object position, i.e. *profit* and *share*. Conversely, in the theme MEASUREMENT, more noun collocates function as objects, e.g. *amount*, while only *level* and *rate* can occur in either position. An example of noun collocates from COCA is given in 5, according to the themes to which they were assigned.

5. The firm's *revenue increased* more than 26 percent to $693.8 million, versus $548.4 million a year earlier (MONEY).

The noun collocates of *rise*, as indicated in Table 7, apparently share three main semantic properties. Two themes overlap with those of *increase*, namely MONEY and MEASUREMENT. A number of nouns frequently appear with both *increase* and *rise* in MONEY, e.g. *cost,* and MEASUREMENT, e.g. *level*. However, the highlight is the theme NATURE, which encompasses the nouns *cloud, dawn, dust, mist, moon, sea, smoke, sun, temperature*, and *tide*. It is clearly seen that this group of noun collocates, which means 'go upward' and acts as subjects of *rise*, although showing a direction, normally describes natural phenomena, such as *cloud, dawn, mist, moon, sea, sun,* or *tide*. Such a noun+verb collocation describing an upward direction of natural or inanimate entity is characteristic of the verb *rise* rather than *increase*. This distinct difference helps distinguish the two synonyms in terms of collocations (Jackson & Amvela, 2007). In other words, this study confirms that looking at collocations frequently co-occurring with each synonym can draw a clear distinction between near-synonyms, which is consistent with previous studies (e.g. Crawford & Csomay, 2016; Gu, 2017; Jirananthiporn, 2018; Li, 2019; Yang, 2016). An example of nouns commonly collocating with *rise* in this sense, i.e. NATURE, is presented in 6.

6. The air was so cold that *mist rose* from the lawn.

An investigation into the nouns that frequently co-occur with *increase* and *rise* seems to shed more light on the usage distinction of both verbs. Although several nouns referring to economic figures and measurements are shared by the two synonyms, the sense of a natural/inanimate entity 'going upward', as in *the sun rises*, is not represented by *increase*, and this seems to be inherently characteristic of *rise*. This collocational difference being pointed out lends support to past studies in that synonyms can be distinguished based on the the collocates with which they can or frequently co-occur (e.g. Crawford & Csomay, 2016; Gu, 2017; Jirananthiporn, 2018; Li, 2019; Petcharat & Phoocharoensil, 2017; Yang, 2016).

Conclusion and Recommendation

Two limitations, nonetheless, are also worth noting. First, since this study focused on the occurrences of *increase* and *rise* in American English as a representative

Table 6 Semantic Preference of Noun Collocates of *Increase*

Semantic Preference	Subject Nouns	Object Nouns	Subject/Object Nouns
1.MONEY	-	profit, share	cost, debt, price, income, revenue, sales, spending, tax, wage
2.MEASUREMENT	-	amount, number, percent, size, speed	level, rate
3.ABILITY	-	capacity, efficiency, productivity	-
4. POSSIBILITY	-	chance, likelihood, risk	-
5.MISCELLANEOUS	population	awareness, production	demand, pressure, temperature

Table 7 Semantic Preference of Noun Collocates of *Rise*

Semantic Preference	Noun Collocates of *Rise*
1. MONEY	cost, earnings, income, inflation, Judd, price, Nasdaq, profit, revenue, sales, stock, wage
2. MEASUREMENT	index, level, rate, toll
3. NATURE	cloud, dawn, dust, mist, moon, sea, smoke, sun, temperature, tide
4. MISCELLANEOUS	consumption, tension, unemployment

of native-speaker English, it would also be interesting to examine this pair of near-synonyms in other Inner-circle Englishes, e.g. British English or New Zealand English, or in the ESL contexts, e.g. Singapore English, Philippine English, Indian English, as well as the EFL contexts, e.g. Thai English, Chinese English, Polish English, Spanish English etc., or to explore similarities and differences between their use in one of those non-native Englishes and native-speaker English. The second limitation concerns the statistics applied in collocation extraction. This study used overall frequency and MI scores to identify typical collocations. Alternatively, some researchers (e.g. Cheng, 2012; Schmitt, 2020) maintain that the collocations obtained from a corpus differ based on the type of statistical measure applied. Further studies using other statistics, e.g. *t*-score, *z*-score, or log-likelihood tests, could interestingly reveal different findings (Phoocharoensil, 2020).

When it comes to vocabulary instruction, EFL learners may reap the benefits of identifying subtle meaning differences between the synonyms *increase* and *rise* from using corpora. When these words occur in authentic texts, such as in corpora (Kanokpermpoon, 2005), learners may be able to use collocates to identify how these words function differently more efficiently than the use of dictionaries (Gu, 2017; Jirananthiporn, 2018; Petcharat & Phoocharoensil, 2017; Yang, 2016). In the present study, *increase* and *rise* function similarly when they collocate with adverbs, but the meaning of *direction* is additionally included in the adverb collocates of *rise*. Another pedagogical implication is grammar instruction. Although it seems possible that *increase* and *rise* may be used interchangeably in some context, EFL instructors can design a data-driven task (Schmitt, 2010) for learners to identify word differences in noun collocates. The results of this study support dictionary meanings and parts of speech in terms of an intransitive verb for *rise* and both transitive and intransitive for *increase*.

Conflict of Interest

The results of this study were analyzed based on the descriptive approach of linguistics. As a result, there is no conflict of interest with other scholars in corpus linguistic studies.

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