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Sufficient or adequate evidence?
Using corpus data to distinguish between
near-synonymous adjectives in academic prose

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Abstract

Using the British Academic Written English Corpus as data, this study attempts to reveal the semantic and usage differences between *adequate* and *sufficient*, two near-synonymous adjectives often used in academic texts. The distributional patterns examined include overall and discipline frequency, syntactic functions, typical noun collocates and modifying adverbs. The results show a preference for *sufficient* in academic prose, where it is distinguished from *adequate* by a more frequent predicative use; an inclination towards *it*-extraposed constructions, and the *VPto* and *pp_for* patterns; the tendency to express more absolute and more specialized meanings; and a close collocational relationship with nouns relating to information. *Adequate*, which is less frequent, tends to more often modify abstract nouns and co-occur with the definite uses of its modifyees, and its uses may involve comparison. Insights from the study can support scholars in their lexical choices in English academic writing.

Keywords

near-synonyms, *adequate*, *sufficient*, distributional patterns, academic prose

Sufficient czy adequate evidence? Wykorzystanie danych korpusowych do rozróżniania bliskoznacznych przymiotników w prozie akademickiej**Abstrakt**

Celem badania, które oparto na danych z korpusu British Academic Written English, jest analiza różnic semantycznych oraz w sposobach użycia pomiędzy *adequate* i *sufficient*, dwoma bliskoznacznymi przymiotnikami często stosowanymi w tekstach akademickich. Badane wzorce dystrybucyjne obejmują częstotliwość występowania w korpusie i w poszczególnych dyscyplinach, funkcje składniowe, typowe kolokacje rzeczownikowe i przysłówki modyfikujące. Wyniki pokazują, że popularniejszym przymiotnikiem w prozie akademickiej jest *sufficient*, który odróżnia się od *adequate* częstszym użyciem predykatywnym; skłonnością do występowania w konstrukcji apozycyjnej z *it* w roli podmiotu, we frazach czasownikowych z bezokolicznikiem oraz przymiokowych z *for*; tendencją do wyrażania bardziej absolutnych i bardziej wyspecjalizowanych znaczeń; oraz bliskimi związkami kolokacyjnymi z rzeczownikami odnoszącymi się do informacji. *Adequate* częściej współwystępuje z rzeczownikami abstrakcyjnymi oraz z formami określonymi kolokatów rzeczownikowych, a jego użycia mogą implikować znaczenie o charakterze porównującym. Wnioski z badania mogą wesprzeć naukowców w dokonywaniu wyborów leksykalnych w angielskiej prozie akademickiej.

Słowa kluczowe

wyrazy bliskoznaczne, *adequate*, *sufficient*, proza akademicka, wzorce dystrybucyjne

1. Introduction

Near-synonyms, or simply synonyms, are words that are highly “similar, but not identical, in meaning; not fully intersubstitutable, but instead varying in their shades of denotation, connotation, implicature, emphasis, or register” (Edmonds and Hirst 2002: 107). They are common in language, unlike absolute synonyms that are identical in all aspects of meaning but very rare. Although near-synonyms refer to the same concept, each highlights its dissimilar nuances, looking at it from different perspectives, in different contexts, for different audiences. Because of their apparently identical meaning, near-synonyms are often defined in a circular manner, where one near-synonym in a set is defined in terms of another, which implies their interchangeability without clearly emphasizing what makes them different. This may impede effective communication, as precision of expression deteriorates without a good understanding of variations in the meaning and usage of near-synonyms. Examples of use are of little help if they are not accompanied by more fine-grained explanations of how the presented usage patterns relate to the shades of meaning conveyed by each near-synonym.

To overcome entanglement into vague dictionary definitions, studies on near-synonyms have turned to corpus-based methods as a way for distinguishing between closely related words. A corpus perspective, according to Moon (2010: 199), allows to uncover “how the phraseological patternings of words are critically important in relation to meaning as well as usage”. Various word classes have been the focus of such investigations, from among which those relevant to this paper are adjectives. Drawing on data from the Corpus of Contemporary American English (COCA), Liu (2010) investigated five synonyms: *chief*, *major*,

main, *primary* and *principal*, concluding that abstract/dual nouns can be modified by each adjective in the set, but only *main* expresses most importance; Crawford and Csomay (2016) explored *equal* and *identical*, discovering that the former tends to co-occur with abstract and the latter, with concrete nouns; Petchrat and Phoocharoensil (2017) studied *appropriate*, *proper* and *suitable*, discovering that they shared only selected collocations and grammatical patterns. Corpus data were also used by Taylor (2002) to examine polarity adjectives for the vertical dimension; by Gries and Otani (2010) to examine selected adjectives of size and their respective antonyms; by Pettersson-Traba (2018) to examine adjectives designating the concept of sweet smelling.

What the reviewed studies share is the assumption that a word is known “by the company it keeps” (Firth 1957: 11), and thus they explore various usage patterns of synonyms, including their collocational and colligational preferences. What, however, these studies fail to consider is a register specific perspective on the examined words that would provide a detailed report on their distributional patterns in a specific register, especially the academic one. The few notable exceptions include Hu’s (2015) and Selmistraitis’ (2020) analyses of synonymous adjective pairs in the academic texts of COCA as well as Szczygłowska’s (2019) study of specificity adjectives in the corpus of British Academic Written English (BAWE). Their common conclusion is that synonymous adjectives have different distributions, meanings and usage patterns even across texts from one register. Nevertheless, it still seems that “research on synonymy is scarce” and “the semantic structure of specific groups of synonyms has received particularly little attention” (Pettersson-Traba 2018: 1).

This study contributes to the existing research by exploring the semantic and usage differences between two synonymous adjectives: *adequate* and *sufficient* in the BAWE corpus. The examined words are relatively frequent in academic prose (e.g. Coxhead 2000, Gardner and Davies 2013) and appear among the top 300 adjective lemmas in the entire BAWE (*sufficient*:

165, *adequate*: 282). The distributional patterns examined include overall and discipline frequency, syntactic functions, typical noun collocates and modifying adverbs.

2. The unique nature of adjectives in academic prose

Adjectives belong to the major lexical word classes and, despite being less numerous than nouns or verbs, appear most frequently in the written registers, particularly academic prose (Biber et al. 2021). They denote the qualitative features of phenomena and may serve, for example, to comment on the findings (e.g. *above-average results*, *the most recent findings*), to describe the research methodology (e.g. *a valid tool to assess*, *experimental methods*) or to denote judgements (e.g. *efficient decoding of emotions*, *perfect analogy*). Adjectives are thus considered an important “communicative tool for scientists” that shows “the author's professional persona”, enabling them to “describe and qualify phenomena observed during the experimental stage and to anticipate agreements or oppositions to claims with caution and strategical consideration of the opinions and views of peers” (Soler 2002: 145). Yet, although adjectives usually constitute a significant proportion of high frequency academic vocabulary, for instance over 19 per cent of the items included in Paquot's (2010: 59) Academic Keyword List, they are often “disregarded in academic textbooks and teaching materials”.

The defining characteristics of adjectives include morphological, syntactic and semantic features (Biber et al. 2021: 502-535). Regarding morphology, adjectives can be inflected to indicate varying degrees of the quality denoted (e.g. *big*, *bigger*, *biggest*), which is known as gradability that can be also marked by the premodifiers *more* and *most* (e.g. *more severe*, *most severe*) and by degree modification (e.g. *deeply internal*, *quite diverse*). The key syntactic feature is the ability to serve attributive and predicative roles by, respectively, premodifying a noun (e.g. *effective reaction*) and complementing a verb (e.g. *outcomes are*

encouraging), though other positions are also possible, such as immediately after a noun (e.g. *something beautiful*). Matešić and Memišević (2016: 181) note that “the positioning of the adjective in relation to the noun can affect the meaning”. For instance, when *responsible* precedes *minister*, it refers to the person’s trustworthiness, which constitutes their permanent characteristic, whereas when the adjective follows the noun, then the minister is conceived of as answerable for a specific task, which constitutes their temporary characteristic. Regarding the semantic grouping of adjectives, there are descriptors and classifiers, where the former denote various qualities, including colour, size, weight, chronology or emotion (e.g. *bright, young, good*), while the latter “delimit or restrict a noun’s referent, by placing it in a category in relation to other referents” (e.g. *initial, English, human*) (Biber et al. 2021: 506). The presence or absence of these core characteristics makes that adjectives fall into two main classes: central and peripheral. Central adjectives are gradable, inflected morphologically, descriptive in meaning and can be used attributively and predicatively, while peripheral adjectives typically do not have one or more of the core features.

Hinkel (2004: 211) explains that in academic prose, adjectives help to manage cohesion, classification and evaluation as well as narrow down the meaning of nouns, making them more precise. Interesting information on the use of adjectives in academic writing has been provided by Biber et al. (2021: 502-535). The researchers point out that academic prose is marked by high frequencies of attributive adjectives, which, as Soler (2002: 153) explains, intensify the meaning of nominal expressions that carry the main informational load of utterances and shift the focus of attention away from the scientist to the phenomenon denoted by the modified noun, adding to the overall objectivity of scientific writing. Particularly common are relational (e.g. *specific, various*) and topical (e.g. *natural, normal*) classifiers, though descriptors denoting size (e.g. *great, high*) and evaluation (e.g. *important, special*) are also frequent. Regarding the less common predicative adjectives, the majority are descriptors that provide a frame for intellectual claims, often signaling epis-

temic stance (e.g. *it is clear that, it is essential to*) but also emotions, attitudes and judgements (Matešić and Memišević 2016: 182). Soler (2002: 153) adds that predicative adjectives emphasize the presence of the scientist, openly visualizing them “as the source of the qualifying statement”, hence predicatively used adjectives are often subjective and evaluative (e.g. *studies are inconsistent regarding the relationship between these factors*).

Commenting on adjectival comparison in academic prose, Biber et al. (2021: 521) note that it is characterized by infrequent use of superlatives, which may result from “reluctance to make extreme claims”, as well as by increased reliance on phrasal comparison with *more* and *most*, which is indicative of a more than average precise choice of descriptive and delimiting words that tend to be polysyllabic. It is also typical of academic prose to use comparative constructions, particularly those of the type adjective-*er than*, which help to explain the nature of phenomena by relating them to other concepts. Interestingly, academic writing is strongly marked by the use of derived adjectives, particularly those formed with the suffix *-al* that supports the coinage of very specialized words, such as *carpopedal* or *tubulointerstitial*, many of which are extremely rare and unprecedented.

3. Dictionary definitions of *adequate* and *sufficient*

A review of the dictionary/thesaurus entries (*TOTDS 1992, OTE 2009, OALD 2022*) of the examined adjectives reveals that they share the basic definition of being enough, especially in terms of quantity, for a particular purpose. The words are often used to define one another and considered interchangeable in modifying some nouns (e.g. *amount, quantity*), as illustrated by dictionary examples. Regarding other shared aspects of usage, *ODAE* (2005) states that the adjectives are used in formal, especially written English, while *TOD AUS* (2000: 10) classifies them as common uncomparable adjectives that “describe absolute states or conditions”. Additionally, both lemmas are evaluative,

as they “express value judgements, either positive or negative”, and thus play an important role in argumentation (Paquot 2010: 59).

Still, a careful scrutiny of other reference sources shows that *adequate* and *sufficient* cannot replace each other in all contexts. For instance, the *MWD* (2022) explains that both words mean “being what is necessary or desirable”, but *sufficient* “suggests a close meeting of a need”, whereas *adequate* “may imply barely meeting a requirement”. *TODAUS* (2000: 10) clarifies that although originally the adjectives “were used in reference to quantity, *adequate* now tends toward the qualitative and *sufficient* toward the quantitative”. This is not fully corroborated by *LDAE* (2009: 13), where *adequate* is admittedly defined as being “enough in quantity” and simultaneously as being “of a good enough quality for a particular purpose”. *WTNIDEL* (1993: 2284) admits that *sufficient* is “marked by quantity, scope, power”, but continues the same entry as follows: “or quality to meet with the demands, wants, or needs of a situation or of a proposed use or end”. Similarly, the *OED* (2009) explains that in reference to things, *sufficient* means “of adequate quality; of a good standard; substantial; in good condition”. Other nuances of meaning suggesting that the examined adjectives may not be fully interchangeable are revealed in the explanations that *adequate* is also used to mean “fairly good, but not excellent” (*LDAE* 2009: 13), “lawfully and reasonably sufficient” (*MWD* 2022) or “fully representative”, and that it is generally “wider in its scope of use than *sufficient*” (*WTNIDEL* 1993: 25, 2285). By comparison, *sufficient* may be used in reference to people who are “of adequate means or wealth; having a competence, substantial, well-to-do; hence, qualified by means or status for an office or duty” (*OED* 2009)

4. The status of *adequate* and *sufficient* as academic words

The academic character of the studied near-synonyms is visible when their frequency of occurrence is considered in the BNC

and COCA corpora. Table 1 shows that in both corpora the two adjectives are preferred in academic prose,¹ where *sufficient* occurs more often than *adequate*: 1.79 times more often in the BNC and 1.19 times more often in COCA. Both words are significantly ($p < 0.001$) more frequent in British than in American academic discourse (*adequate*: $G^2 = 51.38$; *sufficient*: $G^2 = 599.75$)², which may indicate that the users of the former variety of English opt for more formal vocabulary.

Table 1

Frequency of *adequate* and *sufficient* in the BNC and COCA

BNC								
	Total	fiction	newspaper	spoken	magazine	non-acad	misc	acad
<i>adequate</i>	3502	114	160	136	187	732	1026	1147
Per mil	35.02	7.17	15.29	13.65	25.75	44.38	49.24	74.81
<i>sufficient</i>	5827	289	242	238	204	1215	1581	2058
Per mil	58.27	18.17	23.12	23.89	28.09	73.66	75.88	134.23

¹ As of December 2022, the academic sections of COCA and BNC are composed of, respectively, 120,988,348 and 15,331,668 words.

² The G^2 values were calculated using the *UCREL Significance Test System* (Hardie ©1993-2014). Generally, the higher the G^2 value, the more significant the difference is.

COCA									
	Total	TV/Movies	spoken	fiction	newspaper	magazine	blog	web	acad
<i>adequate</i>	17899	291	1024	571	1790	2437	1827	2800	7159
Per mil	18.02	2.27	8.12	4.83	14.70	19.33	14.21	22.53	59.76
<i>sufficient</i>	23918	555	1263	1291	1596	2644	3393	4644	8532
Per mil	24.09	4.33	10.01	10.91	13.11	20.97	26.38	37.38	71.22

The fact that the examined adjectives belong to frequent academic lexis is also evidenced in various academic word lists. Table 2 presents an overview of how *adequate* and *sufficient* are categorized by the compilers of such lists. The lists have been compiled according to different criteria and based on different corpora, which is probably why the status of both adjectives is dissimilar. Only two of the academic vocabulary lists reviewed, namely AWL and AVL, rank *sufficient* higher than *adequate*, which in turn has a higher status in the other three lists. It is worth adding that both words are included in the New General Service List (Browne et al. 2013), which is an updated version of West's (1953) General Service list. The NGSL contains core general words of English that are also considered to be

important for academic study (*adequate*: item no. 2356, *sufficient*: item no. 1930).

Table 2
An overview of *adequate* and *sufficient*
in selected academic word lists

Academic word lists	<i>adequate</i>	<i>sufficient</i>
University Word List (Xue and Nation 1984)	Level 3	not included
Academic Word List (Coxhead 2000)	Sublist 4	Sublist 3
Academic Keyword List (Paquot 2010)	item no. 595	item no. 744
Academic Vocabulary List (Gardner and Davies 2013)	item no. 598	item no. 555
Hinkel's (2020) 160 Most Essential Academic Adjectives	included	not included

5. Methodology

5.1. Corpus

The corpus used in this study is the 6.5-million-word BAWE developed at UK universities. It consists of 2761 successful assessed university assignments collected mostly in 2005 and 2006 at four levels of study, ranging in length from 500 to 5000 words, representing 13 different genres and 35 disciplines in four disciplinary areas of the soft (Arts and Humanities, Social Sciences) and hard sciences (Life Sciences, Physical Sciences) (Nesi and Gardner 2018). The corpus was chosen because it is contemporary and representative of proficient academic writing (Nesi 2011), and can be freely downloaded or accessed through the Sketch Engine corpus query tool, which offers many useful search functions that can help to differentiate between the examined near-synonyms.

5.2. Method

Capitalizing on Liu's (2010) approach to synonymous adjectives in COCA, this research attempts to understand the semantic and usage differences between *adequate* and *sufficient* in BAWE. A four-phrase query and analysis method are used: first, a query of the overall and discipline frequency of each adjective; second, a query of the frequency of each adjective in different syntactic functions (i.e. attributive and predicative); third, a query of the frequency of the adjectives' typical adverb modifiers; fourth, a query and analysis of the semantic types of the nouns typically modified by each adjective. The range for the identification of adverb modifiers was set at -1 to 1 and modified nouns, at one position to the right. In the query of the noun collocates, the collocate attribute was defined as 'word' and the statistic measure of collocation strength was logDice, which is preferred with large corpora and has a maximum value of 14. The tokens of the examined adjectives were manually perused to ensure the proper interpretation of their meaning in context.

6. Results and discussion

6.1. Frequency distribution patterns

The frequency information for the examined adjectives is reported in Table 3, which shows that *sufficient* is around 1.7 times more frequent in BAWE than *adequate*. The difference is significant ($G^2=77.28$, $p<0.001$)³ and reflects the frequency trend observed in the BNC and COCA corpora as well as is itself reflected across the BAWE disciplinary areas. The significantly more common presence of *sufficient* is particularly strong in the social sciences ($G^2=43.55$, $p<0.001$) and the least noticeable in the life sciences ($G^2=4.62$, $p<0.05$). These results suggest a greater potential of the adjective as a core academic word.

³ The calculations were performed on the raw numbers reported in Table 3, using the corpus word counts provided by Nesi and Gardner (2018).

There are also differences in the adjectives' distributions across the BAWE disciplines. *Adequate* is relatively most frequent in the life sciences, with the highest frequency values for food sciences (109.21), health (103.58) and agriculture (101.55). The next are the social sciences, with the highest frequency values for law (110.58), economics (64.16) and sociology (44.62). Then there are the physical sciences, with the highest frequency values for architecture (244.32), planning (75.67) and computer science (68.87). The lowest relative frequency value is recorded for the arts and humanities, where the presence of *adequate* is the strongest in philosophy (91.33), linguistics (43.01) and comparative American studies (22.98).

Sufficient is also relatively least frequent in the arts and humanities, with the highest frequency values for philosophy (166.36), archaeology (50.23) and linguistics (46.09). It is relatively more frequent in the life sciences, with the highest frequency values for food sciences (163.82), agriculture (118.96) and biological sciences (103.13). Then there are the physical sciences, with the highest frequency values for architecture (203.60), engineering (123.05) and physics (110.26). The highest relative frequency value is recorded for the social sciences, where the presence of *sufficient* is the strongest in law (215.53), economics (106.94) and business (97.98).

Despite revealing a degree of variation between the examined adjectives, the corpus data also point to some interesting similarities: both words are relatively more frequent in the discourse of hard rather than soft sciences (*adequate*: 74.80 vs 57.36; *sufficient*: 115.97 vs 105.83) This may be due to the close link that the adjectives have with the concept of quantity, which inscribes in the rigorous analyses of the hard sciences. Moreover, both adjectives have the highest frequency values in the same disciplines in each disciplinary area and occur the least often in the arts and humanities discipline of English. These convergences in the adjectives' frequency distribution are probably due to their synonymous nature.

Table 3
Overall and cross-disciplinary
frequency of *adequate* and *sufficient*

<i>adequate</i>			<i>sufficient</i>		
Disciplinary area	Freq	Freq/mill	Disciplinary area	Freq	Freq/mill
Life Sciences	130	74.09	Social Sciences	284	104.14
Social Sciences	148	54.27	Physical Sciences	157	97.44
Physical Sciences	79	49.03	Life Sciences	167	95.18
Arts and Humanities	65	28.97	Arts and Humanities	109	48.59
Total	422	50.62	Total	717	86.01

6.2. Syntactic functions

The distributions of the examined adjectives' syntactic functions are reported in Table 4, which shows that both words are mainly used attributively, usually in the prepositional position. This finding is not surprising, given that the main function of adjectives is to modify nouns. Considering the total number of the adjectives' uses in BAWE, the tendency towards the attributive use is stronger for *adequate* that occurs in this position around 1.3 times more often than *sufficient*. The predicative use is overall more evident for *sufficient*, which may suggest that the adjective is the preferred one when characterizing those referents that represent shared background knowledge, since new referents are more commonly introduced by adjectives used attributively (Englebretson 1997: 418). When the usage patterns of the adjectives are considered across the soft/hard disciplinary areas, *sufficient* has a clearer preference for predicative use in the soft than in the hard disciplines, respectively, 35.4 % of its 393 total uses and 32.7 % of its 324 total uses. The reverse applies to *adequate*, whose preference for predicative use is more definite

in the hard than in the soft disciplines, respectively, 18.2 % of its 209 total uses and 13.6 % of its 213 total uses.

Table 4

Distribution of the syntactic functions of *adequate* and *sufficient*

Adjective	Prepositive attributive		Postpositive attributive		Predicative		Total
	Freq	%	Freq	%	Freq	%	Freq
<i>adequate</i>	346	82	9	2.1	67	15.9	422
<i>sufficient</i>	449	62.6	23	3.2	245	34.2	717

When used predicatively, both adjectives typically follow the copula *be* and only sometimes other verbs, such as *seem* (e.g. *this evidence does not seem sufficient to prove that*) or *appear* (e.g. *data collection appeared adequate*). Interestingly, *sufficient* is more strongly attracted to *it*-extraposed constructions than *adequate*: 16 tokens vs 1, the majority of which are complemented by *to*-clauses, as illustrated in (1). This suggests that *sufficient* is more willingly used to evaluate propositions in an objective and impersonal way that is “less open to negotiation” (Hewings and Hewings 2002: 370). This finding, coupled with the generally stronger preference of *sufficient* for predicative use, may also indicate that the adjective is chosen over *adequate* when providing a frame for intellectual claims (Biber et al. 2021: 516).

- (1) It is not *sufficient* therefore, to claim the economy of post-war America was thriving and this resulted in the affluent society.

As can be seen from Figure 1, which shows the visualisation generated by the Word Sketch Difference tool for the *adj_subject* pattern, when the adjectives are used predicatively after the copula *be*, they do not share any noun collocates in subject position. The visualisation also reflects the fairly infrequent

predicative use of *adequate*, which has only two salient subject collocates, whereas *sufficient* has seven.

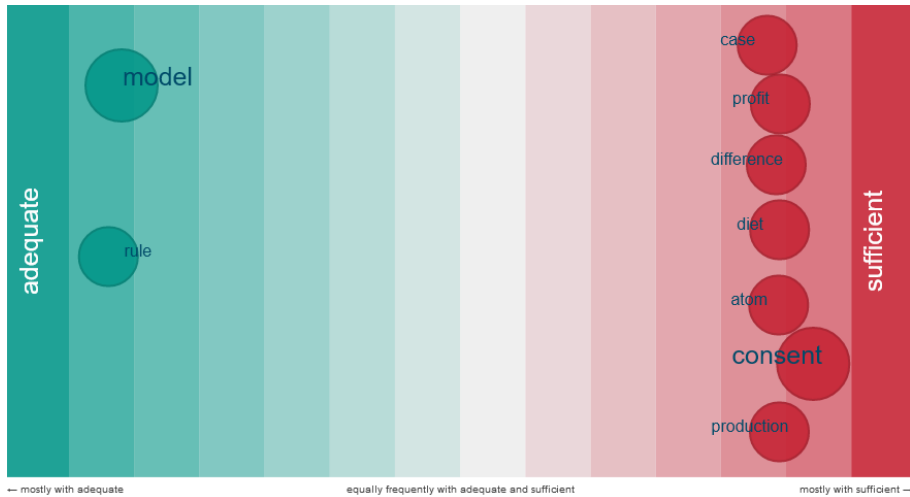


Figure 1

The word sketch difference for the adjectives in the *adj_subject* pattern

6.3. Usage patterns with adverb modifiers

Despite being classified in some dictionaries as incomparable (e.g. *TOD AUS* 2000), the adjectives are sometimes modified by degree adverbs. While *adequate* boasts 28 such tokens, *sufficient* claims only 17. The degree adverbs that the adjectives share are *more* and *enough*: the former is more typical of *adequate* (10 tokens vs 4), while the latter, of *sufficient* (10 tokens vs 1). *Adequate* also frequently co-occurs with *perfectly* and is sometimes modified by *most*, *least*, *very*, *completely*, *fairly* and *sufficiently*, whereas *sufficient* co-occurs with *barely*, *entirely* and *reasonably*. A brief review of these adverbs suggests that *adequate* may have a comparative or superlative form, while *sufficient* – not really, a point made clear in the *CACD* (2008). The tendency of *adequate* to be modified by *more* and *most* suggests it implies a comparison, since phrases such as *a more adequate*

form or *the most adequate way* presuppose that there are other forms or ways that are not as good these ones. This implication is made clear in example (2), where the comparative form of the adjective is used in a comparative construction with *than*.

- (2) Time will have to tell on whether the future regulations proposed by the British government provide a *more adequate*, efficient and transparent solution to the regulation of PMCs *than* has been seen to date.

An examination of the concordances of the discussed co-occurrence patterns reveals that the meaning of *sufficient* is more absolute than that of *adequate* in relation to satisfying a need, as indicated by *MWD* (2022). It appears that the nature of the phenomenon described as *sufficient* is so satisfying that its additional intensification is unnecessary. As shown in example (3), the adjective often co-occurs with adverbs that indicate that the actual state or condition of something considered closely meets what is expected. In turn, example (4) suggests that *adequate* is used to indicate that the specifications relating to the condition of something are only satisfactory, so to minimize this impression the adjective is preceded by a strong degree adverb.

- (3) E.g. the physical barrier of the skin may be *sufficient enough* to keep out some helminths, [...]
- (4) This model is *perfectly adequate* to demonstrate the use of a CRC.

6.4. Usage patterns as noun modifiers

The adjectives' typical modified nouns were selected based on two criteria: the logDice score and frequency. To choose the most representative noun collocates measured by the logDice, the selection threshold was set to four tokens of the noun plus adjective co-occurrence. The nouns typically modified by each adjective, excluding capitalized elements of proper names (i.e. *Housing*, *Records*), are listed in Table 5, where the words are

ordered by logDice score and those that are shared are written in italics. It can be seen that *adequate* has 17 and *sufficient* has 25 typical noun collocates, whose average raw frequency of co-occurrence with their respective modifiers is higher for the latter adjective (Freq.: 6.88 vs 4.7), similarly as the average strength of the collocations they form with the examined adjectives (logDice: 6.42 vs 5.67). This finding may be partly due to the higher overall frequency of *sufficient* in BAWE, but it may also suggest that the adjective has a greater potential to form natural collocations with nouns in academic prose. Six of the nouns listed in Table 5 are shared, with *training* and *food* being stronger collocates with *adequate*, despite the same number of tokens of co-occurrence with each adjective, and *protection*, *amount*, *time* and *number* both co-occurring more frequently and collocating more strongly with *sufficient*.

Table 5

The examined adjectives' typical noun collocates (ordered by logDice score)

adequate			sufficient		
Collocate	Frequency	logDice	Collocate	Frequency	logDice
nutrition ^A	4	7.84	*amounts ^Q	6	7.44
philosophy ^A	5	7.71	funds ^M	5	7.32
diet ^A	5	7.44	interest ^A	12	7.22
*housing ^A	5	7.40	*quantity ^Q	5	7.19
<i>protection</i> ^A	4	6.92	*reason ^A	11	7.17
<i>training</i> ^A	4	6.58	*evidence ^I	17	7.17
<i>amount</i> ^Q	6	6.30	<i>protection</i> ^A	6	7.16
test ^A	6	6.29	*quantities ^Q	4	7.15
*account ^A	5	6.20	*condition ^A	7	7.05
*level ^A	7	5.74	notice ^A	4	6.93
*levels ^A	4	5.70	detail ^I	4	6.77
*water ^S	4	5.50	space ^S	5	6.58

<i>food</i> ^S	4	5.42	<i>air</i> ^S	5	6.55
* <i>way</i> ^M	5	4.84	<i>amount</i> ^Q	8	6.55
<i>number</i> ^Q	4	4.67	* <i>information</i> ^I	13	6.53
* <i>use</i> ^A	4	4.05	<i>training</i> ^A	4	6.30
<i>time</i> ^S	4	3.80	* <i>knowledge</i> ^I	7	6.15
			* <i>conditions</i> ^A	5	5.95
			* <i>resources</i> ^M	4	5.92
			<i>time</i> ^S	16	5.75
			<i>cause</i> ^A	4	5.46
			<i>power</i> ^M	7	5.45
			<i>food</i> ^S	4	5.28
			<i>number</i> ^Q	5	4.92
			<i>data</i> ^I	4	4.64

To determine the semantic differences between the examined adjectives, their typical modified nouns were grouped into five categories developed intuitively after a careful reading of the relevant concordances: abstract (A), means (M), quantity (Q), information (I), and substance (S). These semantic groups, represented by the relevant capital letter, are added in the superscript format next to each noun in Table 5. Explaining some of the proposed categories, it should be noted that certain abstract nouns can also refer to concrete things, for instance, a *test* is abstract when it denotes the action of putting to the proof or concrete when it refers to a written sheet given to students taking an exam. Still, an examination of the context of use of such nouns in the corpus showed that their referents were mostly non-physical entities. The ‘means’ category is related to the idea of some form of means that one has at their disposal: those can be material supplies like *funds to buy new machinery* or more abstract capabilities as in *imprisonment by itself is not an adequate way to punish psychopaths*. Substance nouns denote kinds of matter with uniform properties that are either physical (e.g. *water*) or philosophical (e.g. *time*). The categorization results reported in Table 5 show that *adequate* co-occurs with a greater number of abstract nouns than *sufficient* (11 vs 8), which in turn boasts co-occurrences with a greater number of

nouns in the other categories (means: 3 vs 1, quantity: 5 vs 2, information: 5 vs 0, substance: 4 vs 3). This, however, does not mean that *adequate* or *sufficient* do not modify any of the other nouns on the list.

To obtain a more complete picture of the adjectives' use in all of the proposed semantic categories, BAWE was additionally queried for each adjective's frequency with the collocates unique to the other adjective – all such co-occurrences are marked with an asterisk preceding a given noun in Table 5. The frequencies of these combinations were then added up to each adjective's frequencies with their own typical noun collocates. The results are presented in Table 6 as 'observed frequencies'. A chi-square test⁴ showed a significant difference between the distributions of *adequate* and *sufficient* across the five types of nouns ($\chi^2=29.91$, $df = 4$, $p < 0.0001$, Cramer's $V = 0.2917$). The standardized residuals (R), a cell-by-cell comparison of observed and expected frequencies, were calculated to reveal that three cells (i.e. those with an absolute value of R greater than 1.96) made a significant contribution to the observed difference. From the results presented in Table 6 it can be concluded that *adequate* modifies significantly more abstract and fewer information nouns than *sufficient*, which in turn modifies significantly more information nouns than *adequate*. It thus seems that information nouns are modified almost exclusively by *sufficient* and abstract nouns tend to be modified by *adequate*, although it is the former adjective that has a higher number of tokens in the 'abstract' category, similarly as in all the other categories, including the 'information' one where it dominates.

These findings may be a manifestation of the dictionary explanation implying the tendency of *adequate* "toward the qualitative", since abstract nouns are qualitative in nature for they cannot be seen or touched but rather felt or acknowledged (*TOD-AUS* 2000: 10). Information, in turn, may be of both a qualitative but also a more tangible character, which would correlate with the claim that *sufficient* now opts also for the quantitative

⁴ VassarStats shareware was used for the statistical analysis (<http://vassarstats.net/>).

(*TOD AUS* 2000: 10). This, however, is not fully corroborated by the values of standardized residuals reported for the quantity category in Table 6, where the expected frequencies of *sufficient* with such nouns are slightly lower than the observed ones, while the opposite is the case for *adequate*. This suggests that both adjectives can be used to modify quantity nouns, a point made clear in selected dictionaries (e.g. *LDAE* 2009). The results obtained for the ‘means’ and ‘substance’ noun categories indicate that they can be modified by both adjectives.

Table 6

Standardized residuals in a chi-square contingency table for the co-occurrence of the noun collocates with the examined adjectives

		$\chi^2 = 23.91,$ $df = 4,$ $p < 0.0001,$ Cramer's V = 0.2917	Abstract	Means	Quantity	Information	Substance
			observed Freq	57	7	15	5
<i>adequate</i>	observed Freq		57	7	15	5	12
	expected Freq		39.89	8.45	14.53	16.9	15.21
	R		2.55	-0.5	0.12	-2.9	-0.82
<i>sufficient</i>	observed Freq		62	18	28	45	33
	expected Freq		78.1	16.54	28.46	33.09	29.78
	R		-1.82	0.36	-0.09	2.09	0.59

If then the adjective's synonymous character is manifested particularly by the fact that both can modify means, quantity and substance nouns, this should be also reflected in their usage patterns with these collocates. This assumption was tested by querying BAWE for the tokens of *adequate* and *sufficient* used with the three noun categories in two structural patterns that seem to best express their shared core meaning of “being

enough for a purpose". The first was VPto, in which the adjectives' uses with the nouns⁵ are followed by a *to*-marked infinitive verb phrase illustrated in (5). The analysis of the relevant concordances showed that the frequency of *adequate* in this pattern was only 38.9 % that of *sufficient* (7 vs 18) and its set of different collocates was only half that of *sufficient* (3 vs 6). When the overall frequency of each adjective's tokens in the pattern was calculated (with *to* within two positions to the right), it turned out that the frequency of *adequate* was only 19 % that of *sufficient*: 46 versus 237, which corresponds to 10.9 % of all tokens of *adequate* in the corpus in comparison to 33 % those of *sufficient*. The second structural pattern was pp_for, in which the adjectives' uses with the nouns form a prepositional phrase with *for* illustrated in (6). The analysis showed a similar negative bias in the frequency of *adequate*, whose uses in the pattern were only 14 % that of *sufficient* (1 vs 7) and its set of different collocates was only one-fourth that of *sufficient* (1 vs 4). The overall frequency of *adequate* in the pattern (with *for* within two positions to the right) was only 34 % that of *sufficient*: 25 versus 73, which corresponds to 6 % of all tokens of *adequate* in the corpus in comparison to 10 % those of *sufficient*. This suggests that *sufficient* is more closely related to the concept of serving a purpose or leading toward a goal.

- (5) Moreover, the specification of the testers' expectation leaves students with *adequate time to prepare* themselves for taking the test.
- (6) Therefore, it may be appropriate for the Government to address the issue of benefit and social support levels as they are clearly not providing many with *sufficient funds for* a healthy diet.

⁵ The adjectives' uses with any potential collocate noun from Table 5 in the three categories were considered.

Regarding some other semantic features of the nouns the adjectives modify⁶, BAWE was queried for their singular/plural and definite/indefinite features. The results, reported in Table 7, show that both adjectives modify mainly singular nouns, though this tendency is stronger for *adequate* than for *sufficient* (87.6 % vs 82.6 %). The majority of the singular forms are indefinite, but the nouns' definite singular uses are more often modified by *adequate*, similarly as their definite plural uses, for which however this tendency is less pronounced. Indefiniteness prevails also in the set of plural nouns, particularly those modified by *sufficient*.

Table 7

Percentage results for the singular/plural
and definite/indefinite features of
the nouns modified by the adjectives

Adjective	Singular/ definite	Singular/ indefinite	Plural/ definite	Plural/ indefinite
<i>adequate</i>	9.3	78.4	1	11.3
<i>sufficient</i>	0.5	82.1	0.5	16.8

It therefore seems that the two adjectives differ from one other in respect of the degree of importance each conveys, with *adequate* scoring over *sufficient* in this regard. Liu (2010), commenting specifically on abstract noun collocates of adjectives, suggests that modifyees in the singular form, and especially those with a definite determiner, indicate a higher degree of importance. This can be seen in example (7), where the first mention of philosophy alludes to any philosophy of psychology that is potentially suitable to serve as a basis for ethics, while the second mention of philosophy refers to the only adequate philosophy of psychology that fulfils this purpose.

⁶ The adjectives' uses with any potential collocate noun from Table 5 were considered.

- (7) Her reservations about ethical philosophy without *an adequate philosophy* of psychology" may be reasonable, but I think that once we have *this adequate philosophy*, we will again be bound by moral obligation.

It is also worth noting that some of the adjective-noun pairs, particularly those with *sufficient*, function as specialized terms for domain-specific concepts, examples of which are shown below. The first two are legal in nature: *sufficient interest*, denoting "bias or concern for the advantage or disadvantage of a party to the action or of the subject matter of the action", and *sufficient notice*, denoting "information concerning a fact actually communicated to a person by an authorized person, or actually derived by him or her from a proper source" (DLT 2016). The other two come from philosophy: *sufficient reason*, indicating that everything has a cause and can be explained, and *sufficient condition*, indicating "a proposition whose truth assures the truth of another proposition" (MWD 2022).

- (8) So it will often be impossible to be entirely sure, in advance of litigation, whether any particular applicant has a *sufficient interest*.
- (9) [...] it was held that having their standard terms and conditions of travel available on demand in the station were sufficient notice of these terms.
- (10) [...] the unhappiness which is a result of particular instances of punishment is on utilitarian grounds a *sufficient reason* for regarding it as immoral.
- (11) Therefore, a proposition being self-referent is not a *sufficient condition* for it to be a paradox.

7. Conclusions

This corpus-based study has examined the semantic and usage differences between two near-synonymous adjectives: *adequate* and *sufficient* in academic prose. The main findings can be summarized as follows:

- (i) there is a clear preference for *sufficient* in BAWE;
- (ii) although relatively infrequent, the adjectives' predicative uses are more manifest for *sufficient*;
- (iii) it-extraposed constructions as well as the VP_{to} and pp_for patterns usually attract *sufficient*;
- (iv) *sufficient* has a more absolute meaning, while the uses of *adequate* may involve comparison;
- (v) while abstract nouns tend to be modified by *adequate*, those relating to information are almost exclusively modified by *sufficient*;
- (vi) definite uses of the adjectives' typical noun collocates tend to be modified by *adequate*;
- (vii) selected collocations with *sufficient* function as specialized terms for domain-specific concepts.

This study has its limitations. First, the semantic classification of the adjectives' typical modified nouns was developed intuitively, which makes it partly subjective. Second, due to the limited scope of this paper, disciplinary differences in the use of the examined items were not exhaustively investigated. Future research may thus more systematically explore how different fields shape the two words for their own uses. Still, the reported findings contribute to a better understanding of the adjectives' distributional patterns in academic prose. Insights from this study can be incorporated into reference materials for English academic writers to assist them in choosing the words that more precisely convey the intended meanings.

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