ADJECTIVES *GRAPHIC* AND *GRAPHICAL* IN MODERN ENGLISH: CORPUS-BASED DIACHRONIC STUDY

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This research paper explores the distinction between the two frequently confused adjectives GRAPHIC and GRAPHICAL. It examines their historical development, general patterns of usage, and conceptual differences. Taking a diachronic approach and combining both quantitative and qualitative methods, the study investigates changes in meaning, usage frequency, and collocational behaviour across two distinct time frames: 1990–1994 and 2015–2019. The primary source of empirical data is the Corpus of Contemporary American English (COCA), which offers a balanced and diverse representation of modern American English across various genres.

The analysis involves a detailed examination of etymology, dictionary definitions, and corpus-based evidence. Although GRAPHIC and GRAPHICAL share the same etymological origin and can both be traced back to the early seventeenth century, the findings demonstrate that they have diverged significantly in use. Over time, these adjectives have developed specialized functions and tend to occur in different contexts, which is evident from both their dictionary definitions and real-world usage. Their distribution and collocational preferences reveal consistent differences, especially in terms of the modifiers they combine with.

The study also finds that both adjectives are most frequently used in academic writing, journalistic texts, and magazine articles. Notable differences emerge in the patterns of both premodifiers and postmodifiers accompanying each adjective, with these patterns evolving over the examined periods. Adjective GRAPHIC is more frequently used than GRAPHICAL in both corpus and collocations. Overall, the paper illustrates how corpus linguistics can shed light on subtle lexical distinctions and track language change over time.

Future research could broaden the diachronic scope to earlier historical periods and apply more advanced semantic tools to capture finer shifts in meaning. Comparative studies across different varieties of English and pedagogical insights could further inform how these adjectives are interpreted and taught.

ПРИКМЕТНИКИ *GRAPHIC* ТА *GRAPHICAL* У СУЧАСНІЙ АНГЛІЙСЬКІЙ МОВІ: КОРПУСНОБАЗОВАНЕ ДІАХРОННЕ ДОСЛІДЖЕННЯ

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У дослідженні розглядаються відмінності між двома прикметниками, які часто плутають, – GRAPHIC та GRAPHICAL. Розглянуто їх історичний розвиток, загальне вживання та концептуальні відмінності. Застосовуючи діахронний підхід і поєднуючи кількісні та якісні методи, дослідження аналізує зміни у значенні, вживанні, колокаціях і частотності у двох вибраних періодах: 1990–1994 та 2015–2019 рр. Основним джерелом емпіричних даних є Корпус сучасної американської англійської мови (COCA), що репрезентує збалансовану добірку текстів різних жанрів.

Аналіз охоплює етимологію, тлумачення у сучасних словниках, а також дані корпусного дослідження. Виявлено, що хоча прикметники GRAPHIC і GRAPHICAL мають спільне етимологічне походження та з'явилися на початку XVII ст., з часом вони почали виконувати різні функції та вживатися в різних контекстах. Незважаючи на спільне походження, моделі їх уживання істотно відрізняються, особливо з погляду колокаційної поведінки.

У дослідженні наголошується, що ці прикметники найчастіше трапляються в академічних текстах, новинних публікаціях та журналах. Окрім того, спостерігаються відмінності в модифікаторах, які супроводжують GRAPHIC і GRAPHICAL, як у позиції перед означуваним словом, так і після нього, що особливо помітно під час порівняння двох часових періодів. Прикметник GRAPHIC частіше вживається, ніж GRAPHICAL, як у корпусі, так і в словосполученнях. Зрештою, у роботі показано, як уживання та контексти цих прикметників змінюються з часом і як за допомогою корпусного аналізу можна виявити тонкі лексичні відмінності. Подальші наукові розвідки у сфері виявлення відмінностей між досліджуваними прикметниками можуть бути спрямовані на розширення діахронного аналізу в межах інших історичних періодів, а також на застосування сучасних семантичних інструментів для відстеження найменших змін у значенні та вживанні досліджуваних прикметників. Окрім того, міжмовні зіставлення та педагогічні підходи можуть забезпечити додаткове розуміння механізмів їх розрізнення й ефективного навчання.

Statement of the problem in a general form and its connection with important scientific and practical tasks. In modern linguistics, there is growing interest in analyzing lexical variation across contexts, genres, and time periods, particularly through corpus-based approaches. The adjectives GRAPHIC and GRAPHICAL are frequently confused due to their

similar form, despite differences in meaning and usage. This presents a relevant linguistic problem, because the comprehensive studies about functional and semantic features of adjectives using diachronic corpus methods remain limited.

The theoretical foundation of this article is grounded in the works of both foreign and Ukrainian scholars specializing in corpus linguistics, syntax, and adjective phrase structure. Among foreign scholars, Mark Davies [Davies, 2009], the creator of the Corpus of Contemporary American English, has significantly advanced corpus-based linguistic analysis, enabling detailed diachronic and synchronic studies of lexical variation, along with Graeme Kennedy, whose studies greatly influenced the field of corpus linguistics [Kennedy, 2014]. Ukrainian linguists such as Vasyl Starko [Starko, 2014], Mariia Shvedova [Shvedova, 2010], and Olena Levchenko [Levchenko, 2022] have also made substantial contributions to the field of corpus linguistics, developing methodologies for computerized analysis. Together, these contributions create a comprehensive theoretical framework for our study, particularly in analyzing the distinction between GRAPHIC and GRAPHICAL across different time periods and registers.

The given work **aims** to conduct a corpus-based diachronic analysis of the concepts of GRAPHIC and GRAPHICAL using the Corpus of Contemporary American English.

The research tasks include the following:

– to identify the etymology and definitions of GRAPHIC and GRAPHICAL;

– to bring together the key theoretical points about the adjectives GRAPHIC and GRAPHICAL;

– to establish the general information and compare the concept of GRAPHIC and GRAPHICAL in the period from the year 1990 to 1994 and from 2015 to 2019;

– to analyze the collocations with the adjectives GRAPHIC and GRAPHICAL in the period from the year 1990 to 1994 inclusive.

The **object** of the research is the adjectives GRAPHIC and GRAPHICAL in modern American English.

The **subject** of the research is the corpus-based diachronic study of the adjectives GRAPHIC and GRAPHICAL in various categories and the exploration of the difference between these concepts in the two periods: from 1990 to 1994 and from 2015 to 2019.

Analysis of recent research and publications. Corpus linguistics has experienced a notable resurgence in recent times, expanding its horizons, as noted by Tony McEnery and Andrew Wilson [Wilson & Tony, 2001, p.1]. According to Hans Lindquist and Magnus Levin, this study enables the investigation of language patterns and phenomena, including a vast number of qualitative and quantitative methods of analysis that can be used by scholars from various theoretical backgrounds [Lindquist, 2009, p. 1]. It relies on pre-established linguistic descriptions, categories, and classifications that are subsequently tested and refined through the analysis of corpus data. Graeme Kennedy mentioned that within this framework, the corpus functions not as the central object of investigation, but rather as an empirical tool for validating existing theoretical assumptions [Kennedy, 2014, p. 290].

According to Michael McCarthy and Ronald Carter, an adjective phrase is composed of at least one adjective functioning as the head and serves two primary purposes in larger structures: modifying nouns through the attributive function and complementing copular verbs through the predicative function. In the attributive function, adjective phrases modify nouns by typically appearing as premodifiers. When an adjective phrase is used as the complement of a copular verb like appear, be, become, feel, get, look, remain, seem, smell, sound, or taste, it serves a predicative function within the clause [Cambridge Grammar of English, 2006, pp. 441–443].

Results and Discussion. In this article, the diachronic study analyzes the usage of the adjectives GRAPHIC and GRAPHICAL across two time periods (1990–1994 and 2015–2019). Utilizing COCA corpus data, the research investigates their contextual meanings, synonymous relations, and syntactic behavior through concordance line analysis, with particular attention to their co-occurrence with premodifiers and postmodifiers.

The origins of the word GRAPHIC are dated to the mid-1600s. The term 'graphic' has been in use since before 1637, as evidenced by the writings of Ben Jonson, a renowned poet and playwright (Oxford English Dictionary, n.d.). GRAPHIC refers to something that is depicted or explained in a highly explicit manner, often used to describe things that are disturbing or startling. Another interpretation of the term is connected to the artistic usage of images, forms, and text, particularly in literature and periodicals. The term GRAPHIC originates from the Latin word "*graphicus*", which is derived from the Greek words "*graphikos*" which means capable of painting or drawing (Collins Online Dictionary | Definitions, Thesaurus and Translations, n.d.).

COCA's definitions are: 1) describing nudity or sexual activity in graphic detail; 2) evoking lifelike images within the mind; 3) written, drawn, or engraved (Corpus of Contemporary American English (COCA) | UVA Library, n.d.).

Synonyms for the adjective GRAPHIC given by COCA are explicit, detailed, explicit, full, graphic, lifelike, realistic, striking, vivid, illustrative, diagrammatic, graphic, illustrative, pictorial, and visual. Adjective GRAPHIC is a more frequent adjective

than GRAPHICAL. It is encountered in the corpus 11015 times and applied mostly in such categories as Blog, Web, Spoken language, Magazines, News, and Academic journals. In the corpus ranking, this adjective is listed at number 5311, indicating its high level of significance (see Figure 1).
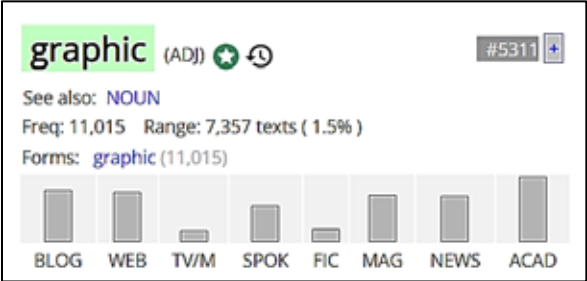

Figure 1. The frequency of the adjective GRAPHIC

The term GRAPHICAL originated in the English language through the process of derivation of graphic by adding the suffix -al. The earliest citation of the adjective GRAPHICAL was found in the works of William Folkingham in 1610 (Oxford English Dictionary, n.d.). Adjective GRAPHICAL has the same origin as its etymon.

GRAPHICAL pertains to graphics, which are visual representations of data or information. It specifically refers to images or videos that are displayed on the screen of a digital device, such as a computer. Additionally, it can also refer to data that is represented by a graph. This term is commonly used in technical contexts (Collins Online Dictionary | Definitions, Thesaurus and Translations, n.d.). COCA

provides two definitions of GRAPHICAL: 1) relating to or presented by a graph (Figure 2);
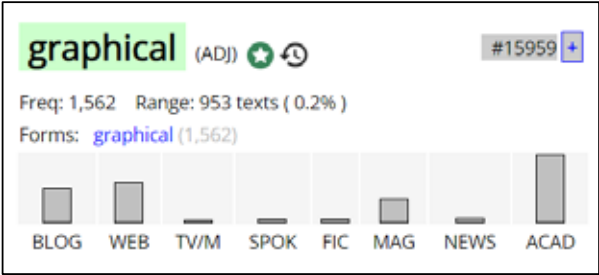

Figure 2. The frequency of the adjective GRAPHICAL

2) written, drawn, or engraved (Corpus of Contemporary American English (COCA) | UVA Library, n.d.). Adjective GRAPHICAL can be partly a synonym of GRAPHIC, while the corpus provides no synonyms for this word. This adjective is a less frequent one than GRAPHIC. It is encountered in the corpus only 1562 times and applied mostly in categories Blog, Web, and Academic journals. GRAPHICAL ranks much lower (#15,959) than GRAPHIC in COCA frequency (see Figure 2).

Observing the frequency of usage of the adjective GRAPHIC in two periods, 1990-1994 (see Figure 3) and 2015-2019 (see Figure 4), no substantive change in it is noticed, as the figures are 1494 and 1454, respectively. The only difference is displayed in increasing Academic and Spoken language frequency numbers (Fig. 3, 4).

Figures 5 and 6 present the top 10 collocates of GRAPHIC in the periods 1990–1994 and 2015–2019,

Figure 3. The frequency of GRAPHIC in the 1990–1994 period

SECTION	ALL	BLOG	WEB	TV/M	SPOK	FIC	MAG	NEWS	ACAD	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19
FREQ	1494	0	0	28	483	64	288	423	208	1494	0	0	0	0	0
WORDS (M)	993	128.6	124.3	128.1	126.1	118.3	126.1	121.7	119.8	121.1	125.2	124.6	123.1	123.3	122.8
PER MIL	1.50	0.00	0.00	0.22	3.83	0.54	2.28	3.47	1.74	12.34	0.00	0.00	0.00	0.00	0.00

Figure 4. The frequency of GRAPHIC within 2015–2019 period

SECTION	ALL	BLOG	WEB	TV/M	SPOK	FIC	MAG	NEWS	ACAD	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19
FREQ	1454	0	0	108	228	89	367	311	351	0	0	0	0	0	1454
WORDS (M)	993	128.6	124.3	128.1	126.1	118.3	126.1	121.7	119.8	121.1	125.2	124.6	123.1	123.3	122.8
PER MIL	1.46	0.00	0.00	0.84	1.81	0.75	2.91	2.55	2.93	0.00	0.00	0.00	0.00	0.00	11.85

respectively, with nouns occurring in the postmodifier position. According to the content of the tables, the colocations are different. During the years 1990-1994, the most frequently occurring phrases were GRAPHIC *dollar, designer, artist, arts,* and *design*, which can be explained by the rapid development of the graphic design discipline and the expansion of the printing industry. Although these phrases were still frequent for 2015–2019, such collocations as GRAPHIC *novel, novels, and organisers* were more frequent, which gives reasons to believe that the remarkable development of the gaming industry, especially graphic novels, influenced the usage of this adjective. However, the most frequent collocates rose significantly in 2015–2019, likely due to greater collocational diversity (Fig. 5, 6).

Adverbs are also parts of adjective phrases and play the role of premodifiers for the adjective GRAPHIC. The total frequency of utilization of adverbs also has not changed. The most common adverbs in 1990–1994 are *most, more, very, too,* and *so*. Such adverbs as *brutally* and *quite* also occur in this period (see Figure 7). In 2015-2019, there is a slight change in usage, and the most frequent ones are *more, very, too, pretty,* and *so*. There is an exceptional use of adverbs *extremely, highly*, alongside a reduced use of *most* (see Figure 8).

A comparison of pre- and postmodifiers accompanying the adjective graphic is presented below. Examples of premodifiers as adjectives, adverbs, and copular verbs used in 1990–1994 were as follows: *As pure **commercial graphic** designers/illustrators. And to give you one **very graphic** illustration… The report includes **some graphic** footage. An attack on Catholic feminism, provides a **more graphic** image… The pamphlets have **to be graphic** if we are going to instruct people how to save lives.* In 2015–2019 usage was following: *It makes his music very visual, **very graphic**. What that woman was saying was **pretty graphic** in detail. Rated R for language and **brief graphic** nudity. You tweeted an **extremely graphic** bestiality video. At Highland Park, female students*

Figure 5. Top 10 collocates of GRAPHIC with nouns in 1990

Figure 6. Top 10 collocates of GRAPHIC with nouns in 2015–2019

Figure 7. Top 10 collocates of GRAPHIC with adverbs as premodifiers in 1990–1994
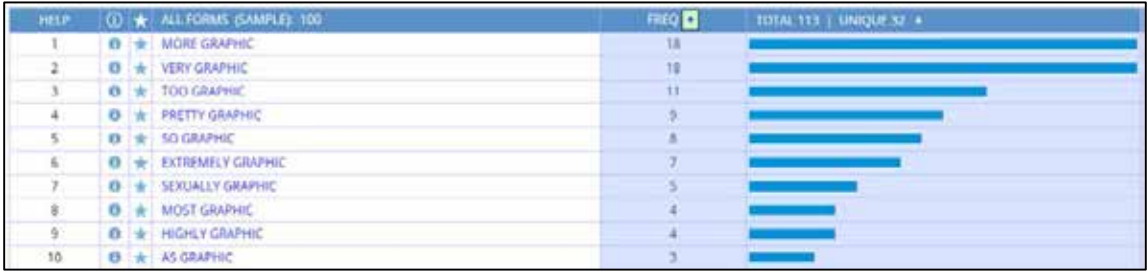
Figure 8. Top 10 collocates of GRAPHIC with adverbs as premodifiers in 2015–2019

*are constantly pressured to share risqu? or even **sexually graphic** images of themselves with male students.* Analysing the premodifiers given above, the usage of adverbs and adjectives is high, while copular verbs aren't so frequent. Words in context usually referred to the concept of sexual activity.

Examples with postmodifiers in 1990–1994 were commonly nouns: *Turns out his hypnotherapist was a **graphic designer** with just 20 hours of hypnosis training. The **graphic artist** was born in Richland in 1951. I'm in **graphic design**, and computers are putting me out of business. The team's report spells out in minute and **graphic detail** the consequences of a series of mistakes. **Graphic images** of the composite areas are displayed on screen and may be printed.* In 2015–2019, most frequently used postmodifiers were also nouns, as in examples: *If he'd been in a **graphic novel**, the artist would have drawn a dialogue bubble for it. Using a variety of techniques, including **graphic organizers**… The day after Hussle's death, the muralist and **graphic designer** approached a Marathon Clothing store manager… The social media giant wrote on Twitter that it had taken the*

*additional step of blocking all versions of the video edited to remove the **graphic content** at the behest of local authorities… The play was also notable for its **graphic nudity**, which gave the violent perpetrator of the play's key dramatic episode startling vulnerability.* The number of use postmodifiers is extremely high, exceeding 300 instances. The examples primarily relate to the concepts of drawing, nudity, design, and works of art.

Examining the usage of frequency of the adjective GRAPHICAL during two distinct periods, namely 1990–1994 and 2015–2019 (see Figures 9, 10), it becomes evident that the adjective was employed 161 times during the former period and 136 times during the latter. Both periods show a high frequency of using GRAPHICAL in Magazines and Academic language.

In Figures 11 and 12, there are tables with the most frequent top 10 combinations of GRAPHICAL and nouns as postmodifiers. It can be observed that the most frequent nouns in 1990-1994 are *analysis, interface, user, interfaces,* and *representation,* which can be explained by the usage of GRAPHICAL in

Figure 9. The frequency of GRAPHICAL within 1990–1994

Figure 10. The frequency of GRAPHICAL within 2015–201

academic language. In 2015–2019, nouns such as *representation, representations, models,* and *displays* show the highest utilization, which might be related to the rapid development of mathematics and physics, as the adjective GRAPHICAL is related to them. The use of words *interface, representation,* and *user* is observed in both periods, although they show different frequencies and positions in the tables. The studied words demonstrate considerable semantic and conceptual similarity, likely due to the restricted usage of the adjective GRAPHICAL (Figures 11, 12).

Adjective GRAPHICAL is less usable than GRAPHIC, which can be observed by comparing their frequencies. An extremely small number of adverbs are used with this adjective as premodifiers, which might be due to its handling only in academic texts from 1990 to 1994. Adverbs *highly, up, more, just, and how* are used with it (see Figure 13). In 2015–2019, this number decreased to two adverbs:

more and *as* (see Figure 14). The total number of all adverbs that act as premodifiers is nine words.

The usage of premodifiers with the adjective GRAPHICAL is much lower than with GRAPHIC in COCA. Examples of premodifiers as adjectives and adverbs used in 1990–1994 were as follows: *As has been suggested earlier in this paper, we believe that this **highly graphical** form of representing structural information is suitable for numerous other applications. As such, its **stunning graphical** interface looks like something out of King's Quest V… Because of the **explicit graphical** representation of associations in the E-R representation…* Otherwise, in the 2015–2019 period, the range of premodifiers is not a bit higher and richer: *A second line of research has studied extensions of **probabilistic graphical** models… A program for analysis of **Bayesian graphical** models using Gibbs sampling.* All examples above refer to the concept of drawn images.

Figure 11. Top 10 collocates of GRAPHICAL with nouns in 1990–1994

Figure 12. Top 10 collocates of GRAPHICAL with nouns in 2015–2019

Figure 13. Collocates of GRAPHICAL with adverbs as premodifiers in 1990–19

Figure 14. Collocates of GRAPHICAL with adverbs as premodifiers in 2015–2019

Most frequent postmodifiers in 1990–1994 were presented with nouns: *In addition, America Online hopes Redgate will hasten a change in its **graphical interface** to one that is more engaging through the use of sound and video. To illustrate this relationship we use the **graphical analysis** of chaos theory as a geometric model and apply it to the complex process of semidesert-soil production. These operating environments – called **graphical user** interfaces… A **graphical representation** of the vertical displacements for the seated male subject are shown in Figure 5.* The number of postmodifiers in 2015–2019 was lower, but the same nouns were used, as shown in the following examples*: The time series maps, a **graphical representation** where data points are indexed against time. Remote Desktop Services, which help provide a **graphical interface** for connecting to Windows computers over the Internet. A second line of research has studied extensions of probabilistic **graphical models** to capture sets of probability distributions (*(Fig. 13, 14).

Conclusions and prospects for further developments in this area. A diachronic analysis of the concepts GRAPHIC and GRAPHICAL was conducted using a corpus of COCA texts to reveal their distinct usage characteristics between 1990–1994 and 2015–2019. By comparing the usage of these concepts, it became evident that the adjective GRAPHIC was more frequently employed than GRAPHICAL. Furthermore, the research indicates that both words were predominantly found in the texts belonging to the domains of Academic English, News, and Magazines. The first known use of these adjectives was at the beginning of the seventeenth century, and they share a similar etymology and Latin-Greek roots. A comparison of the concepts of these words in modern dictionaries reveals that they have distinct meanings. GRAPHIC means something that refers to images used artistically and depicts explicit nudity in a detailed manner, while GRAPHICAL refers to a concept or idea that is visually represented through a written graph.

Adjectives GRAPHIC and GRAPHICAL were often used with nouns, adjectives, and adverbs as premodifiers, and nouns as postmodifiers. Premodifiers typically employed with the term GRAPHIC include adverbs (*most, such, many, brutally, extremely*), and occasionally adjectives (*commercial, pretty, brief*). However, their occurrence saw a decline from 2015 to 2019 when compared to subsequent years. On the other hand, the term GRAPHICAL was also accompanied by premodifiers such as adverbs (*highly*) and adjectives (*stunning, explicit),* but their number remains constant. Postmodifiers were more frequently used with the adjectives under study. Nouns as postmodifiers with GRAPHIC were typically paired with postmodifiers *dollar, designer, artist, novel, organ-*

izer, and *design*. When it comes to the noun GRAPHICAL, it was commonly accompanied by nouns *analysis, interface, user, representation, abstract,* and *models*. Consequently, the findings of the investigation demonstrated a greater prevalence of collocates containing GRAPHIC as opposed to GRAPHICAL.

Future research could extend the analysis beyond 1990–2019 to explore broader trends in the use of GRAPHIC and GRAPHICAL. Using tools like word embeddings or collocation networks could offer deeper insights, while cross-linguistic studies and applications in language teaching could help clarify distinctions and help learners.

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