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NON-FINITE FORMS AS MARKERS OF GRAMMATICAL COMPRESSION IN SCIENTIFIC STYLE

As scientific communication continues to develop in response to the rapidly increasing volume of information, the study of grammatical compression becomes particularly relevant. Modern academic discourse demonstrates a clear tendency toward structural economy, clarity, and informational density, which requires linguistic mechanisms capable of condensing complex ideas without reducing semantic precision. Non-finite verb forms constitute one of the most productive grammatical tools for achieving such compression. However, despite their frequent use in academic writing and public scientific communication, their functional and stylistic potential remains insufficiently explored, especially with regard to their role in shaping syntactic economy in contemporary English scientific discourse.

The aim of the article is to analyse the role and functions of non-finite verb forms as mechanisms of grammatical compression in modern English scientific texts. The object of the study is grammatical compression as a characteristic feature of the English scientific style. The subject of the research comprises non-finite verb forms and the patterns of their functional realisation as markers of grammatical compression in scientific discourse.

The theoretical part of the study outlines the linguistic foundations of grammatical compression and describes the structural and functional characteristics of infinitives, gerunds, and participles based on modern grammatical and lexicographic sources. Special attention is paid to the ways in which non-finite constructions allow authors to replace full subordinate clauses, thereby reducing syntactic complexity while preserving logical relations within the sentence.

The practical analysis is based on selected examples from Nobel Prize lectures, Nobel Prize Award Ceremony addresses, and Nobel Banquet speeches. These texts, representing formal academic and public scientific discourse, demonstrate how infinitival, participial, and gerund constructions function as effective means of syntactic and semantic condensation. The analysis shows that non-finite forms contribute significantly to the informational density, structural efficiency, and coherence characteristic of modern scientific communication.

Keywords: *non-finite verb forms, infinitive, gerund, participle, grammatical compression, Nobel Prize lectures, academic discourse, syntactic economy.*

The statement of the problem. The statement of the problem. The phenomenon of grammatical compression occupies an important place in contemporary linguistic studies, as it reflects the tendency of scientific discourse toward clarity, conciseness, and structural efficiency. Modern research in discourse analysis and functional linguistics emphasises that academic communication increasingly relies on compact grammatical structures that allow authors to present complex information in a logically organised and economically expressed form.

A number of linguistic studies have addressed the structural and functional properties of non-finite verb forms and their role in English grammar. In traditional descriptive grammars, non-finite forms are defined as verb forms that do not express person, number, or tense and include infinitives, participles, and gerunds. These forms are characterised by their multifunctionality and their ability to combine verbal and nominal features, which enables them to perform various syntactic roles within the sentence. Contemporary lexicographic and grammatical sources, including the

Cambridge Dictionary and Collins Dictionary, also emphasise that non-finite constructions often replace full clauses and thus contribute to the structural reduction of sentences while preserving their informational content [6; 7; 8].

In modern linguistic research, grammatical compression is commonly interpreted as the reduction of syntactic complexity through the use of more compact grammatical structures without loss of semantic content. This tendency is particularly characteristic of scientific and academic discourse, where clarity, precision, and informational density are essential communicative requirements. Within this framework, non-finite verb forms function as productive mechanisms that allow authors to integrate subordinate meanings into condensed syntactic constructions.

Despite the considerable attention devoted to non-finite verb forms in English grammar, their stylistic and functional role as markers of grammatical compression in scientific discourse remains insufficiently explored, especially in the context of contemporary academic and public scientific texts. Consequently, further investigation of non-finite constructions is necessary in order to clarify their contribution to the syntactic economy and communicative efficiency of modern English scientific style.

The **object** of the study is grammatical compression as a characteristic feature of the English scientific style.

The **subject** of the research comprises non-finite verb forms and their functional-realisation patterns that serve as markers of grammatical compression in scientific discourse.

Analysis of recent research and publications. Theoretical Background. The theoretical framework of the present study is based on contemporary linguistic approaches to grammatical compression as a characteristic feature of scientific discourse. In the *Oxford Concise Dictionary of English Etymology*, the prefix **non-** is explained as a marker of negation used with nouns, adjectives, participles, gerunds, and adverbs. The dictionary traces its origin to the Latin particle *non* meaning 'not', which later entered Old French and Middle English in the same form. Early examples cited in English include formations such as *non-power*, *non-residence*, and *nonsuit*, already attested in the fourteenth century. Over time, the use of the prefix widened, particularly in technical and scientific vocabulary, where it became a productive means of forming terms with the meaning of absence, negation, or exclusion (e.g., *nonchalant*, *nondescript*, *nonsense*, *nonsuit*) [1]. In the *Macmillan School Dictionary*, the adjective **finite** is defined as "*existing only in limited numbers or amounts, or continuing only for a limited time*," and is contrasted with infinite [2].

Grammatical compression is understood as the reduction of syntactic complexity through the use of compact grammatical structures while preserving the informational content and logical coherence of the utterance. In scientific and academic writing, this tendency contributes to clarity, economy of expression, and structural efficiency. According to the Cambridge Dictionary, *a non-finite verb is in the infinitive form or is a participle and does not show the tense and subject of the verb*. Non-finite verb forms do not express tense, person, or number and include infinitives, -ing forms, and past participles [Cambridge Dictionary, 2026]. The Collins Dictionary distinguishes finite and non-finite verbs based on tense and subject agreement. Non-finite verbs include the present participle, past participle, base form, and the to-infinitive. Grammatical compression refers to the process of reducing the structural length of a sentence while retaining its informational content [9].

According to *L. Verba's Grammar of Modern English*, infinitive is defined as a non-finite form of the verb denoting an action without reference to person, number, or tense [Верба, 1997, p. 88]. In Modern English, it appears in various structural forms, including the Indefinite, Continuous, Perfect, and Passive Infinitive. Its use is closely connected with the temporal and aspectual relations between the infinitive and the finite verb. In scientific discourse, the infinitive demonstrates a high degree of functional versatility, performing subject, predicative, object, attributive, and adverbial functions [3, p. 89]

The participle is characterised as a non-finite verb form combining verbal, adjectival, and adverbial properties. English distinguishes between the Present Participle and the Past Participle, both of which contribute to grammatical compression by forming reduced relative clauses and compressed adverbial constructions. Participial structures allow authors to integrate descriptive and explanatory information directly into noun phrases, thereby increasing informational density [3, p. 102].

The gerund is described as a non-finite verb form possessing both verbal and nominal features. It retains verbal properties such as the ability to take objects and express aspect and voice, while simultaneously functioning as a noun within the sentence. In scientific texts, gerund constructions are widely used to nominalise processes and actions, enabling the compression of entire subordinate clauses into compact syntactic units [3, p. 115, 116].

The issue of the *Visnyk of Lviv Polytechnic National University* presents a detailed investigation into the syntactic behaviour and communicative functions of the English infinitive in authentic popular-scientific texts on computer engineering. The research, conducted by *L. V. Ilnytska*, offers a comprehensive statistical and functional analysis of infinitive constructions, drawing on a corpus of articles published in *New Scientist* and *The Economist* between 2004 and 2006. The study provides valuable insights into the diversity of syntactic positions in which the infinitive operates and the semantic nuances it introduces into scientific discourse.

According to Ilnytska's findings, the **infinitive** demonstrates considerable structural versatility, fulfilling a range of predicate-related, subject-related, and object-related functions. One of the observed patterns includes the infinitive as part of a **compound verbal predicate**, typically following modal or semi-modal verbs to express actions associated with necessity, predictability, or potentiality, as in *"Much work remains to be done before such a technology becomes a reality."* [4, p. 68]. The infinitive can function as a **subject**, often in anticipatory it-constructions, which shift the logical subject and add evaluative meaning. The subjective infinitive construction, typically in passive forms, expresses expectation or assessment.

It also frequently appears as part of a **complex object** after verbs of cognition, intention, or effort, especially when describing research aims. Additionally, the infinitive serves as a **direct object** after lexical and modal verbs, particularly when indicating intended actions [4, p. 69].

In its attributive role, the infinitive specifies purpose or potential, enhancing precision in technical descriptions. As an adverbial modifier, it most commonly expresses purpose or result, supporting the logical structure of scientific texts.

Modal infinitive constructions (with *should, may, might*) are widely used to convey recommendations, hypotheses, and evaluations of possibility [4, p. 70].

Task statement. The **aim** of the paper is to analyse the role and functions of non-finite verb forms as mechanisms of grammatical compression in modern English scientific texts.

To achieve this aim, the following **objectives** have been set:

– to outline theoretical foundations of grammatical compression within modern linguistics;

– to characterise the main features of the scientific style and its communicative requirements;

– to classify the types of non-finite verb forms in English and define their structural properties;

– to determine the functional load of infinitives, gerunds, and participles in expressing compressed grammatical structures;

– to identify the most frequent patterns of grammatical compression in scientific texts;

– to analyse selected examples illustrating the use of non-finite forms as means of syntactic and semantic condensation;

– to establish the relationship between grammatical compression and the overall coherence and efficiency of scientific discourse.

Outline of the main material of the study. In Nobel Prize lectures, non-finite verb forms systematically function as mechanisms of grammatical compression. Infinitival and participial constructions replace full finite clauses, eliminating explicit subjects, auxiliaries, and subordinating conjunctions. Such syntactic choices contribute to textual density, rhetorical clarity, and stylistic elevation characteristic of formal scientific and public discourse.

In **William Faulkner's** Nobel address, infinitive constructions function as central devices of grammatical compression. In the sentence *"I would like **to do** the same with the acclaim too…"* the infinitive phrase *to do* the same serves as an object complement after the verb would like. Instead of using a finite complement clause such as *I would like that I do the same*, the infinitive replaces the finite verb, the subject, and the complementizer, thus compressing the syntactic structure. This usage illustrates object-complement compression, where a non-finite form substitutes an entire finite clause.

A similar mechanism is observed in the statement *"…the basest of all things is **to be afraid**"*. The infinitive *to be afraid* functions as a predicative complement and replaces the fuller construction *that a person is afraid*. The compression eliminates the subject, the finite verb, and the conjunction, transforming the proposition into a nominalised structure suitable for expressing general evaluation. This represents subject-complement reduction through an infinitive construction.

In the sentence *"...not for glory and least of all for profit, but **to create** out of the materials of the human spirit something which did not exist before"* the infinitive *to create* expresses purpose. It replaces the finite purpose clause *so that he could create*, omitting the subject, the modal auxiliary, and the subordinating conjunction. The infinitive thus condenses a potentially long subordinate clause into a compact verbal phrase, maintaining rhetorical flow while expressing intentionality [11].

Infinitive constructions also play a significant role in **Linus Pauling's** Nobel Peace Prize lecture. In the phrase *"...such as **to permit** me to be here today"* the infinitive *to permit* functions as a reduced result clause. Instead of the finite structure that permits me to be here today, the infinitive removes tense marking and the explicit subject, allowing the resultative meaning to be expressed in a concise form characteristic of formal scientific discourse.

A particularly illustrative example of infinitive compression appears in the sentence *"We have learned that not only the explosives factories but also the peace congresses are necessary **to get** the civilized nations **to recoil** from war and discharge their troops"*. The infinitive *to get* reduces a finite subordinate clause such as so that they can get. The compression removes subject (they), modal (can), conjunction (so that). Full form: *…are necessary **so that they can get** the civilized nations **and they will recoil**…*

The infinitive serves as a complement to necessary, creating a compact purposive relation [15].

Participial constructions are another productive means of grammatical compression. In **Faulkner's** sentence "*…teaching himself that, forget it forever, leaving no room in his workshop…*" the present participle teaching replaces a finite temporal clause *such as when he teaches himself that*. The compression removes the subject, the finite verb, and the subordinating conjunction. Similarly, the participial phrase leaving no room functions as a reduced clause of result instead of and this will leave no room. In both cases, participial constructions merge subordinate meanings into the main clause, reducing syntactic weight while preserving logical relations.

Reduced relative clauses formed by participles are also characteristic of scientific and ceremonial discourse. In the phrase "*…the dramatic progress **being made** in a new form of Artificial Intelligence*", the participial construction *being made* replaces the finite relative clause *which is being made*. The omission of the relative pronoun and auxiliary verb results in a compact noun phrase with high informational density, typical of academic style [11].

Gerund constructions further contribute to grammatical compression by nominalising actions and processes. In **Linus Pauling's** expression "*I express my heartfelt gratitude to the Nobel Committee of the Norwegian Storting for having selected me for this great honor; to all the people of Norway; and to those people all over the world whose **striving** for peace has led to a degree of success*", the gerund *striving* replaces the relative clause *who strive for peace*. The compression eliminates the relative pronoun and the finite verb, embedding the meaning of continuous action into a single nominal unit [15].

A similar pattern is observed in **John Steinbeck's** sentence "*He is charged with **exposing** our many grievous faults and failures, with **dredging up** to the light our dark and dangerous dreams…*". The gerunds *exposing* and *dredging up* replace finite clauses such as *that he exposes* and *that he dredges up*. These gerund constructions function as complements governed by the preposition with, eliminating explicit subjects and finite verb forms while maintaining syntactic parallelism and rhythmic balance [16].

Gerund compression is also evident in the **Nobel Prize Award Ceremony 2020** statement "*Only by **understanding** the coronavirus, how it infects people and the mechanisms whereby it causes disease…*". The gerund *understanding* replaces the finite adverbial clause *only when we understand*. The subject, conjunction, and finite verb are omitted, resulting in a compact non-finite construction that retains the semantic relation of condition. Despite its non-finite form, the construction maintains a clear semantic link to an implicit generalized subject [14].

Finally, in **Geoffrey Hinton's** public scientific discourse, gerund constructions appear as a means of explanatory compression. In the sentence "*This new form of AI excels at modeling human intuition rather than human reasoning, …*" the gerund *modeling* replaces the explanatory clause *how it models human intuition*. The construction eliminates the subject, the finite verb, and the complementizer, transforming the process into an abstract conceptual unit typical of scientific language [12].

Conclusions. The conducted research demonstrates that non-finite verb forms constitute an important mechanism of grammatical compression in modern English scientific discourse. The theoretical background established the essential linguistic foundations for understanding grammatical compression as a universal tendency of formal and academic language. Special attention was devoted to dictionary definitions and to the descriptions of non-finite verb forms provided in authoritative linguistic sources. The analysis shows that infinitives, gerunds, and participles actively contribute to the reduction of syntactic complexity by replacing full finite clauses with more compact grammatical structures.

The practical examination of examples from *Nobel Prize lectures, Nobel Prize Award Ceremony addresses*, and *Nobel Banquet speeches* confirms that non-finite constructions enable speakers to omit explicit subjects, auxiliaries, and subordinating conjunctions while preserving the semantic relations

between clauses. Infinitival constructions most frequently express purpose and complement relations, gerunds allow the nominalisation of processes and actions, and participial constructions function as reduced relative or adverbial clauses that integrate additional information into the main clause.

Thus, non-finite verb forms significantly increase informational density and structural economy in formal scientific and public academic discourse. Their frequent use contributes to the conciseness, coherence, and efficiency that are characteristic of modern English scientific communication.

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Новак Д. Н., Гриців Н. М. NON-FINITE ФОРМИ ЯК МАРКЕРИ ГРАМАТИЧНОЇ КОМПРЕСІЇ В НАУКОВОМУ СТИЛІ

У процесі розвитку наукової комунікації, зумовленого постійним зростанням обсягу інформації та необхідністю її ефективної передачі, особливої актуальності набуває дослідження явища граматичної компресії. Сучасний науковий дискурс характеризується прагненням до лаконічності, структурної економії та високої інформативності, що зумовлює активне використання мовних засобів, здатних передавати складні змісти у компактній синтаксичній формі. Одним із найпродуктивніших засобів досягнення такої компресії є нефінітні форми дієслова. Водночас їхній функціональний та стилістичний потенціал у сучасних англомовних наукових текстах досліджено недостатньо, що визначає необхідність подальших лінгвістичних розвідок.

Метою статті є аналіз ролі та функцій non-finite форм дієслова як механізмів граматичної компресії в сучасних англомовних наукових текстах. Об'єктом дослідження є граматична компресія як характерна ознака англійського наукового стилю. Предмет дослідження становлять нефінітні форми

дієслова та особливості їх функціональної реалізації як маркерів граматичної компресії в науковому дискурсі.

У теоретичній частині роботи окреслено лінгвістичні засади дослідження граматичної компресії, а також охарактеризовано структурні й функціональні властивості інфінітива, герундія та дієприкметника на основі сучасних граматичних і лексикографічних джерел. Особливу увагу приділено здатності нефінітних конструкцій замінювати підрядні речення та інтегрувати додаткову інформацію у межах компактних синтаксичних структур.

Практичний аналіз здійснено на матеріалі Nobel Prize lectures, Address at the Nobel Prize Award Ceremony та Banquet speeches. Ці тексти, що належать до академічного та публіцистично-наукового дискурсу, демонструють, як інфінітивні та дієприкметникові конструкції, а також герундій забезпечують синтаксичну економію та сприяють підвищенню інформативності й структурної цілісності наукової комунікації.

Ключові слова: *інфінітив, герундій, дієприкметник, граматична компресія, лауреати нобелівських премій, академічний дискурс, синтаксична економія.*

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