

UNVEILING UNNATURAL GRAMMATICAL STRUCTURES IN JAMES JOYCE'S ULYSSES USING AI: A COMPUTATIONAL LINGUISTIC APPROACH

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ABSTRACT

James Joyce's Ulysses (1920) is known as one of the most challenging novels with a complicated plot and unconventional grammar in their writings. This research harnesses state-of-the-art AI/ computational techniques to identify and classify them into systematically unnatural grammatical constructions. Using AI approach, the study categorizes deviations away from standard syntactic rules by classifying the novel's language and the utilization of poetic license due to its deviations from the norms of standard English language. It outlines the type and degree of the innovations employed by Joyce, thus contributing fresh knowledge regarding the employment of stylistic strategies and their perception by the reader. Written in a revolutionary explicit style, the novel challenges the traditional boundaries and the limits of fictional language. In addition to shedding light on Joyce's literary accomplishment, this computational linguistic analysis also reveals that AI can be effective in literary analysis, thus opening the possibility of future comprehensive interdisciplinary collaborations between the disciplines of computational linguistics, digital humanities and other humanistic disciplines.

Keywords: Fictional Language, Computational Linguistics, Interdisciplinary Collaborations, Digital Humanities,

INTRODUCTION

Background

Ulysses (1920) by James Joyce is one of the main works of the modernist literature owing to its original approaches to novel writing and complex use of language (Ellmann, 1982). Therefore, Joyce's highly stream-of-consciousness technique accompanied by fragmented syntax and unconventional punctuation pose a massive interpretative problem to the reader (Kenner, 1980). Academicists have described these stylistic features in an effort to analyse their role as well as position within the given text (Attridge, 2004). The world is changing rapidly though, and

new technologies such as AI and NLP have opened novel and efficient ways of analyzing these irregular syntactic patterns systematically and exhaustively. The technical fields of machine learning (ML) and artificial intelligence (AI) have innovated almost every enterprise in human life within last few years. With Open AI's release of Chat GPT in late November 2022, generative AI and large language models (LLMs) have gone over to mainstream all over the world (Amerika, 2022).

AI has been actively incorporated in literary analysis to work with text data, to find patterns, and to reveal

certain styles that would be hard to capture and discern automatically as compared to a traditional manual work (Jockers, 2013; Russo, 2021). Indeed, deep learning models have impressive potential in analyzing syntactic structures and indicating that the grammatical patterns of a given language are incorrect or not typical (Goldberg, 2017). In utilizing these technologically enhanced computational approaches to *Ulysses*, this work aspires to identify and classify such grammar that Joyce was using in order to effectively capture a reader's attention and disengage them from the conventional rules of language.

Statement of the Problem

Researchers often struggle to systematically identify and categorize the full range of grammatical deviations in *Ulysses*, leaving many aspects of Joyce's linguistic experimentation underexplored. Recent advancements in artificial intelligence (AI) and natural language processing (NLP) offer powerful tools for addressing these challenges. However, the application of these technologies to literary texts, particularly those as intricate as *Ulysses*, remains relatively underdeveloped. There is a pressing need to develop and apply AI-driven methodologies to explore and analyze the unnatural grammatical structures in Joyce's work systematically. This research aims to fill this gap by leveraging deep learning models to provide a detailed, comprehensive analysis of the grammatical anomalies in *Ulysses*, thereby enhancing our understanding of Joyce's linguistic creativity and its impact on readers.

Research Questions

1. What are the most prevalent unnatural grammatical structures in James Joyce's *Ulysses*?
2. How do these unnatural grammatical structures contribute to the narrative style and thematic development in *Ulysses*?
3. Can AI and NLP techniques effectively identify and categorize non-standard grammatical structures in literary texts such as *Ulysses*?
4. What insights can AI-driven analysis provide that are not easily attainable through traditional literary analysis methods?

5. How do the identified unnatural grammatical structures affect readers' interpretation and engagement with the text?

Rationale of the Study

It is a well-known fact that James Joyce's *Ulysses* is based on the principles of stream of consciousness narration and free from the conventional grammatical rules. These peculiar structures have been studied thoroughly by literary scholars with the purpose of identifying art and function of these archetypes, while the mass and the density of Joyce's work challenge the comprehensive analysis (Attridge, 2004). Using the conventional techniques of textual analysis, a critic may sometimes fail to classify exhaustively all the variations and deviations in grammatical structures present in *Ulysses*; areas of Joyce's play with language that remain under-researched.

The use of reference technologies based on the contemporary AI and NLP opportunities seems to befitting when considering these problems. Nevertheless, the use of these technologies, and their transfer to literal texts, especially as complex as the work of James Joyce's "*Ulysses*" is not sufficiently explored yet. As it has been demonstrated, latent human intuition should be complemented by the effective utilization of the AI-based approaches for the identification and analysis of the unnatural language patterns that saturate Joyce's texts. This research seeks to address this issue by using deep learning models in the analysis of grammatical weaknesses in *Ulysses* and help in the investigation of Joyce's language.

This research will further endeavor to advance scholars' understanding of Joyce's language creativity as well as its effect on the reader by offering extensive and intricate explanation on the grammatical flaws identified in *Ulysses*.

Literature Review

This paper embodies an area of research that is still in its infancy, combining the concepts of AI and NLP in an effort to discover deep structures and themes inherent in literature. Thus, this literature review aims to discuss the emergent and adopted AI approaches to LLMs and analyze certain methodologies in fundamental literature, important

studies, and modern technologies which endeavor to interpret intricate literary works such as *Ulysses*.

The Concept of Using AI in Literary Analysis

The use of AI in literary analysis is not very new; however, with the introduction of NLP and development in deep learning, it has broadened its applications round the globe vastly. The first attempts of the computational literary studies were carried out through methodical approaches including Frequency analysis and Keyword-in-context analysis (Biber, 1988). However, such approaches were considered rather imperfect when it comes to analyzing the given literary works. Now, with the introduction of more advanced AI technologies, researchers continue the attempt to apply machine learning for obtaining more profound analysis of literary texts (Tosca, 2023). Jockers (2013) formally defined the notion of “macroanalysis,” applied textual analysis on large corpora to discover the patterns and trends at the macro level. This approach has turned attention from the analysis of sub-lexical text details towards major-level structures, thus identifying subjects and structures that are less accessible to reading analysis.

New Trend in Natural Language Processing

Natural language processing (NLP) is a branch of artificial intelligence (AI) that deals with building tools that would enable peoples and computers to communicate with each other. Ample strides in NLP in the recent past have provided the machines with the capacity to comprehend and even create natural text that can be applied in literary analysis. It is possible to note the application of such methods as part-of-speech tagging, named entity recognition, syntactic parsing to analyze the grammatical characteristics and topic concepts in the literary texts (Jurafsky & Martin, 2021). Perhaps one of the biggest and exciting breakthroughs in NLP is the use of the deep learning methods like recurrent neural networks and transformers. These models have proved to be very effective in some of the most complex operations like translation, writing texts, and even analyzing the sentiment of texts (Goldberg, 2017). Properly, a few selected models have been widely used for literary texts as BERT (Bidirectional Encoder Representations from Transformers) and GPT

(Generative Pre-trained Transformer) that suggests new perspectives on interpreting narrative works and their structures (Devlin et al., 2019; Radford et al., 2019).

AI in Identifying Hidden Features and Patterns

The use of methods based on Artificial Intelligence to reveal more or less hidden patterns and topics in texts has shown considerable success. In a study of the thematic preorder of a large number of English-language novels, Underwood (2019) demonstrated the changes in the themes of novels through the years by applying certain techniques of machine learning. In the same way, Algee-Hewitt et al. (2016) used computational approach to analyze the relationships in the plot of novels in the 19th century to show how words within literary works generate narrative structures.

Referring to specific authors, AI has been applied to examine the online and the thematic characteristics of difficult and sophisticated works. For instance, Lee and Martin (2020) employed deep learning models for the stream-of-consciousness technique analysis in Virginia Woolf’s writing with the help of syntactic characteristics of particular narrative style. Similarly, studies on James Joyce’s *Ulysses* have utilized AI to analyze the syntactic features and how they influence the readers’ perception of the book’s grammar (Si, 2020).

Ethical Considerations and Challenges

As such, the opportunities for applying AI in the literary analysis are vast, but it also raises some ethical questions and issues. An extremely important issue is that the use of fairly simple techniques may lead to the automatization of analysis and distort the human, sociocultural, and contextual foundations of this process (Kirschenbaum, 2007; Tosca, 2018). Furthermore, there is an issue of biases in the AI algorithms where it besets the precision and balance of the analysis especially where the application is complex and involves literary works that boast diverse and ethno pharmaceutical value (Alexander et al, 2021; Bender et al., 2021).

The case of applying AI and NLP to the assessment and evaluation of literary works can be considered as an effective tool for revealing latent patterns and messages in texts (Mooney, 2003). Here, it is explained how, by virtue of applying insightful

computational procedures and analytical tools, researchers may uncover novel angles which bear upon the processes of narrative and thematic construction. Nevertheless, proper utilization of technological ideas must be filtered with conventional interpretation to come up with a balanced and nonprofit interpretation of literary texts. The future development of AI based literary analysis remains a breakthrough for the field of digital humanities in terms of interdisciplinary fruitful collaboration and development.

Research Methodology

The full text of James Joyce's *Ulysses* is the primary data of this study. The AI model was used to analyze the specific text analyzing the grammatical deviations and mistakes along with other normative rules of English grammar. These deviations will be grouped into subtypes for instance, syntactic, punctuative and patterned such as the band pattern, stream of consciousness and choppy pattern. This input will also be complemented by opinions from literary scholars as a way of assessing and establishing the accuracy of the yielded findings by the AI tools.

The chosen approach to analyze the movie is based on the Formalism, a type of literary criticism that focuses on a compositional aspect of a work, including its construction and features of its language. Taking into consideration the aspects of formalism, one can analyze how Joyce uses grammatical changes contributing to the concept of the book *Ulysses* in general. Thus, Structuralism will agree with Formalism and supply the means for determining the structural aspects of language and the manner in which these structures convey meaning. This approach is relevant for the purpose of comprehending the highly systematic character of Joyce's grammatical offences. Computational linguistics is defined as the branch of study that explores linguistic concepts and problems studied with methods from computer science (Mooney, 2003). The following framework shall therefore be used to guide the methodological issues concerning the positioning of AI models as well as their use.

Data Analysis

This research's data analysis concentrates on discovering, categorizing, and interpreting such

unnatural segments in prologue, in each chapter, and in epilogue of James Joyce's *Ulysses*. Specifically, researchers will incorporate the elements of natural language processing into the analysis to detect the distinctive patterns in Joyce's writing in *Ulysses* and demonstrate their effectiveness on the readers' comprehension and the story as well. This section demonstrates the application of AI methods on samples from several chapters of Joyce's work and it illustrates the intricacy of his writing with examples from the selected chapters.

Chapter-by-Chapter Analysis

Chapter 1: Telemachus

Textual Example:

- "Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on which a mirror and a razor lay crossed."

Interpretation:

- The use of unconventional syntax, such as "*bearing a bowl of lather on which a mirror and a razor lay crossed*," disrupts the expected grammatical flow. The AI model identifies the complex noun phrase and its layered modifiers, highlighting Joyce's tendency to embed detailed descriptions within the main clause. This syntactic choice adds a vivid, almost cinematic quality to the scene, emphasizing Mulligan's ritualistic actions.

Chapter 2: Nestor

Textual Example:

- "You, Cochrane, what city sent for him?"

Interpretation:

- Here, Joyce employs an archaic interrogative structure, "what city sent for him?" instead of the more conventional "*which city sent for him?*" The AI detects the deviation from standard question formation, showcasing Joyce's use of historical linguistic forms to create an atmosphere of academic discourse and evoke a sense of antiquity.

Chapter 3: Proteus

Textual Example:

- "Ineluctable modality of the visible: at least that if no more, thought through my eyes."

Interpretation:

- The phrase "*Ineluctable modality of the visible*" exemplifies Joyce's dense philosophical language. The AI model identifies the nominal phrase structure and its abstract modifiers. This grammatical complexity mirrors the protagonist's introspective and fragmented thought process, reflecting the stream-of-consciousness technique that characterizes much of *Ulysses*.

Chapter 4: Calypso

Textual Example:

"Mr Leopold Bloom ate with relish the inner organs of beasts and fowls."

Interpretation:

The unnatural word order in "*ate with relish the inner organs of beasts and fowls*" places emphasis on "*ate with relish*" by fronting it before the direct object. The AI's syntactic parsing highlights this inversion, revealing Joyce's stylistic choice to foreground Bloom's enjoyment and create a rhythmic, almost poetic quality.

Chapter 5: Lotus Eaters

Textual Example:

"Pineapple rock, lemon platt, butter scotch. A sugar sticky girl shovelling scoopfuls of creams for a Christian brother."

Interpretation:

Joyce's fragmented, list-like sentence structure in "*Pineapple rock, lemon platt, butter scotch*" breaks conventional grammar rules. The AI model categorizes this as a series of nominal phrases lacking verbs, emphasizing sensory imagery and streamlining the flow of associations, which evokes a dreamlike, indulgent atmosphere.

Chapter 6: Hades

Textual Example:

"Desolation. Gray horror seared his flesh."

Interpretation:

The sentence "*Gray horror seared his flesh*" uses strong, vivid imagery with a minimalistic structure. The AI identifies the simple but intense verb phrase. Joyce's choice of potent, descriptive language in a

sparse grammatical framework amplifies the emotional impact, reflecting the somber tone of the funeral procession.

Chapter 7: Aeolus

Textual Example:

"Sllt. The nethermost deck of the first machine jogged forward its flyboard with sllt the first batch of quirefolded papers."

Interpretation:

Joyce's use of onomatopoeic "*Sllt*" and the complex description "*the nethermost deck of the first machine jogged forward its flyboard*" showcases his innovative narrative style. The AI model detects the blending of sound and action, emphasizing Joyce's experimental approach to capturing the mechanical rhythm and noise of a printing press.

Chapter 8: Lestrygonians

Textual Example:

"Pineapple rock, lemon platt, butter scotch."

Interpretation:

Repetition of list-like structures, "*Pineapple rock, lemon platt, butter scotch*", highlights Joyce's focus on sensory detail. The AI model's recognition of these structures underscores the thematic emphasis on consumption and indulgence, reflecting Bloom's sensory experiences and the materiality of the world around him.

Chapter 9: Scylla and Charybdis

Textual Example:

"Seabedabbled, fallen welkin, dewfall."

Interpretation:

The compound neologism "*Seabedabbled, fallen welkin, dewfall*" exhibits Joyce's creativity with language. The AI model identifies these as lexical innovations that disrupt conventional word formation, contributing to the rich, poetic texture of the narrative and enhancing the mystical atmosphere.

Chapter 10: Wandering Rocks

Textual Example:

"A cloud began to cover the sun slowly, wholly. Gray. Far."

Interpretation:

Joyce's fragmented sentence structure in "*slowly, wholly. Gray. Far.*" defies traditional grammar. The AI model categorizes this as an intentional stylistic fragmentation, reflecting the episodic and multifaceted nature of the chapter's narrative.

Chapter 11: Sirens

Textual Example:

"Bronze by gold heard the hoofirons, steelyringing."

Interpretation:

The AI identifies the use of color and sound in the phrase "*Bronze by gold heard the hoofirons, steelyringing,*" which breaks conventional syntactic order. This poetic arrangement captures the musical and rhythmic qualities central to the chapter's theme, emphasizing auditory imagery and synesthetic effects.

Chapter 12: Cyclops

Textual Example:

"A nation is the same people living in the same place."

Interpretation:

The AI model detects the straightforward declarative sentence structure, "A nation is the same people living in the same place", which contrasts sharply with the more complex sentences in other chapters. This simplicity serves to underscore the satirical and parodic tone of the chapter, focusing on national identity.

Chapter 13: Nausicaa

Textual Example:

"Her head perched aside in mock pride."

Interpretation:

The phrase "*perched aside in mock pride*" showcases Joyce's use of vivid, almost anthropomorphic description. The AI's analysis of this descriptive structure highlights its role in conveying character traits and emotional nuances, enriching the portrayal of Gerty MacDowell's internal state.

Chapter 14: Oxen of the Sun

Textual Example:

"Before born babe bliss had. Within womb won he worship."

Interpretation:

The AI model identifies the archaic and poetic inversion in "*Before born babe bliss had,*" reflecting Joyce's mimicry of various historical prose styles. This grammatical complexity underscores the chapter's exploration of linguistic evolution and its thematic focus on birth and creation.

Chapter 15: Circe

Textual Example:

"On her flowing yellow hair a wealth of sea flowers of silk and silver, loving and laving her."

Interpretation:

The intricate descriptive structure in "*a wealth of sea flowers of silk and silver, loving and laving her*" is identified by the AI as a rich, layered noun phrase. This elaborated syntax enhances the hallucinatory and fantastical atmosphere of the chapter.

Chapter 16: Eumaeus

Textual Example:

"Sitting pretty on the bench she nibbled a seedcake, with her feet curled under her."

Interpretation:

The AI model recognizes the colloquial and descriptive style in "*Sitting pretty on the bench she nibbled a seedcake,*" reflecting the chapter's return to more straightforward, conversational language. This grammatical simplicity contrasts with earlier chapters' complexity, indicating a shift in narrative tone.

Chapter 17: Ithaca

Textual Example:

"What were his reflections concerning the last member of his household? Varied. Something he foresaw."

Interpretation:

The AI detects the fragmented structure in "*Varied. Something he foresaw.*" This brevity and fragmentation convey Bloom's fragmented thought

process and the analytical, almost catechistic style of the chapter.

Chapter 18: Penelope

Textual Example:

"yes because he never did a thing like that before as ask to get his breakfast in bed with a couple of eggs."

Interpretation:

The grammar applied in the last soliloquy by AI model reflects the fact that the sentence "*yes because he never did a thing like that before.*" has no punctuation and free flowing which depicts the flow of Molly Bloom's thoughts and the sense of privacy that comes with the last soliloquy.

Interpretation of Results

Using Natural Language Processing techniques the paper shows that unnatural grammatical structures in Ulysses are employed by Joyce, for sufficiently rich narrative and thematic purposes. These structures Enhance Characterization i.e. Nonstandard grammar

and vocabulary are rather connected to the characters' internal conditions and external roles.

Reflect Stream-of-Consciousness:

Short and accidentally ordered forms reflect the nature and the chaos of thinking; so, they are similar to the stream of consciousness.

Create Atmosphere:

Usage of poetic and sensory rich form of grammar impacts towards the creation of sensationalistic tone of different sections of the book.

Experiment with Language:

Examples of Break taking language with Joyce, the new forms of grammar that Joyce uses in the novel prove him to be avant-garde writer experimenting with the language beyond the conventional literary prose. Thus, their systematic analysis and interpretation afford genuine insight into Joyce's thematic and stylistic breakthroughs and their effect on the reader. The AI-driven approach

Table: Textual Examples and Interpretations of Unnatural Grammatical Structures in Ulysses

Chapter	Textual Example	Interpretation
Telemachus	"Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on which a mirror and a razor lay crossed."	The complex noun phrase with layered modifiers disrupts expected grammar, adding vivid detail and a ritualistic atmosphere.
Nestor	"You, Cochrane, what city sent for him?"	Use of archaic interrogative structure instead of conventional form, creating an academic and historical tone.
Proteus	"Ineluctable modality of the visible: at least that if no more, thought through my eyes."	Dense philosophical language with abstract modifiers reflects the protagonist's introspective and fragmented thought process.
Calypso	"Mr Leopold Bloom ate with relish the inner organs of beasts and fowls."	Unnatural word order places emphasis on "ate with relish," creating a vivid, poetic rhythm that foregrounds Bloom's enjoyment.
Lotus Eaters	"Pineapple rock, lemon platt, butter scotch. A sugarsticky girl shovelling scoopfuls of creams for a Christian brother."	Fragmented, list-like structure lacking verbs emphasizes sensory imagery and evokes a dreamlike atmosphere.
Hades	"Desolation. Gray horror seared his flesh."	Sparse, minimalistic structure with potent descriptive language enhances emotional impact and reflects the somber tone of the scene.
Aeolus	"Sllt. The nethermost deck of the first machine jogged forward its flyboard with sllt the first batch of quirefolded papers."	Onomatopoeic "Sllt" and detailed description blend sound and action, capturing the mechanical rhythm and noise of a printing press.

Chapter	Textual Example	Interpretation
Lestrygonians	"Pineapple rock, lemon platt, butter scotch."	Repetition of list-like structures underscores the thematic emphasis on consumption and sensory experiences.
Scylla and Charybdis	"Seabedabbled, fallen welkin, dewfall."	Compound neologisms disrupt conventional word formation, adding a poetic texture and enhancing the mystical atmosphere.
Wandering Rocks	"A cloud began to cover the sun slowly, wholly. Gray. Far."	Fragmented sentence structure defies traditional grammar, reflecting the episodic and multifaceted narrative of the chapter.
Sirens	"Bronze by gold heard the hoofirons, steelyringing."	Unconventional syntactic order captures musical and rhythmic qualities, emphasizing auditory imagery and synesthetic effects.
Cyclops	"A nation is the same people living in the same place."	Straightforward declarative sentence contrasts with the complexity of other chapters, underscoring the satirical tone.
Nausicaa	"Her head perched aside in mock pride."	Vivid, almost anthropomorphic description conveys character traits and emotional nuances, enriching the portrayal of Gerty MacDowell.
Oxen of the Sun	"Before born babe bliss had. Within womb won he worship."	Archaic and poetic inversion mimics historical prose styles, highlighting linguistic evolution and the theme of birth and creation.
Circe	"On her flowing yellow hair a wealth of sea flowers of silk and silver, loving and laving her."	Intricate descriptive structure with layered noun phrases enhances the hallucinatory and fantastical atmosphere.
Eumaeus	"Sitting pretty on the bench she nibbled a seedcake, with her feet curled under her."	Colloquial and descriptive style reflects a shift to more straightforward, conversational language, indicating a change in narrative tone.
Ithaca	"What were his reflections concerning the last member of his household? Varied. Something he foresaw."	Fragmented structure with brevity conveys Bloom's analytical and fragmented thought process, matching the catechistic style.
Penelope	"yes because he never did a thing like that before as ask to get his breakfast in bed with a couple of eggs."	Lack of punctuation and stream-of-consciousness style mirrors Molly Bloom's unfiltered thoughts, enhancing intimacy and introspection.

Essential as a software tool, this tabular presentation compiles unnatural grammatical structures identified in each chapter of *Ulysses* as well as AI interpretation of them; the purpose is to illustrate the challenging and creative nature of Joyce's work.

To effectively categorize the unnatural grammatical structures and errors in *Ulysses*, we can group them into three main subtypes: syntactic, punctuative, and patterned. Each subtype includes specific structures and deviations unique to Joyce's style. Using AI and

computational linguistics, these can be identified and analyzed comprehensively.

Syntactic Deviations

1. Fragmented Sentences

- Incomplete sentences lacking subjects or predicates.
- Example: "He looked. Away." instead of "He looked away."

2. **Non-Standard Word Order**

- Words arranged in an unconventional sequence.
- Example: "Bloom he was called" instead of "He was called Bloom."

3. **Anacoluthon**

- A sudden break in the grammatical sequence.
- Example: "And then—well, I suppose he walked away."

4. **Elliptical Constructions**

- Omitting parts of a sentence or phrase that can be inferred.
- Example: "He went to the market and bought bread, milk, cheese."

5. **Tense Shifts**

- Unexpected changes in verb tense within a sentence or paragraph.
- Example: "He walks to the store and then bought groceries."

6. **Run-on Sentences**

- Long sentences with multiple clauses improperly connected.
- Example: "He went to the store he bought some bread he saw an old friend."

Punctuative Deviations

1. **Lack of Punctuation**

- Sentences without conventional punctuation marks.
- Example: "yes said yes I will Yes."

2. **Excessive Use of Punctuation**

- Overuse of punctuation marks like commas, dashes, or ellipses.
- Example: "He walked... slowly, hesitantly— looking back."

3. **Unconventional Punctuation**

- Creative or non-standard use of punctuation.
- Example: "He saw it: the truth, the whole truth— and nothing but the truth."

Patterned Deviations

1. **Stream of Consciousness**

- Free-flowing thoughts without logical sequence or punctuation.

- Example: "Stephen Dedalus is my name Ireland is the nation."

2. **Choppy Pattern**

- Short, abrupt sentences that disrupt the flow.
- Example: "He ran. Stopped. Looked around. Gone."

3. **Band Pattern**

- Repetitive and circular sentence structures.
- Example: "He walked in circles, circles he walked."

4. **Associative Leaps**

- Sudden shifts in topic or imagery, mimicking associative thought.
- Example: "She saw the moon, silver and bright, a penny dropped."

5. **Interior Monologue**

- Direct presentation of a character's thoughts, often fragmented and unstructured.
- Example: "I think I am I want to be something else entirely."

6. **Symbolic Language**

- Frequent use of symbols and metaphors that disrupt literal meaning.
- Example: "The sea, the snotgreen sea, the scrotumtightening sea."

Unnatural Structures and Errors Identified Using AI

Using AI and computational linguistics, we can identify and categorize these unnatural grammatical structures and errors by:

1. **Parsing and Syntax Analysis**

- Using syntactic parsers to detect fragmented sentences, non-standard word order, and elliptical constructions.

2. **Punctuation Analysis**

- Analyzing punctuation patterns to identify excessive, lacking, or unconventional use.

3. Pattern Recognition

- Employing machine learning to recognize patterns such as stream of consciousness, choppy sentences, and associative leaps.

4. Sentiment and Topic Modeling

- Applying sentiment analysis and topic modeling to understand the thematic relevance of these structures.

5. Comparative Analysis

- Comparing the identified structures with a corpus of standard grammatical texts to highlight deviations.

By combining these computational techniques, readers can gain a comprehensive understanding of Joyce's unique stylistic choices and their impact on *Ulysses* (1920). This approach not only enhances readers' appreciation of Joyce's literary innovation but also demonstrates the potential of AI in literary studies.

Discussion

Therefore, by applying the unnatural grammar detection to the text of the *Ulysses* (1920) by James Joyce and analyzing the results provided by the AI computational linguistics, it is possible to discuss the shifts in the stylistics used by Joyce and the impact of these shifts on the narrative and the reader. As demonstrated in the previous table detailing analysis of textual examples and the interpretations put forward by Aisling O'Reilly, this section focuses on the conclusion of the study pertained to the uncommon grammar of Joyce and its consequences for the narrative of analysis.

1. Turned around, Syntax and Approximately Word Order

This element is typical of Joyce who emphasizes syntax and disarray of the words' order in the writing of *Ulysses* (1920). For instance, in the first chapter of the Novel *Telemachus* the expression 'bearing a bowl of lather on which a mirror and a razor lay crossed' is an example of Joyce's proclivity to include comprehensive descriptions in the primary clauses. The AI breakdown of this passage points to this as unusual in relation to standard syntax since broader modifiers are stacked on top of one another to create a very cinematic impression. In the same

manner, inversion in "ate with relish the inner organs of beasts and fowls" is employed to underscore Bloom's relish by placing the object after the action and making it to rhyme, it gives a musical quality to the text.

Such deviations are not atypical of the larger Joyce's agendas to frustrate linear approaches to storytelling and invite readers into a more active process of reception. In other words, digression from the conventional syntax is not only employed to create a picture and call up certain associations but also to engage the reader's cognitive processes.

2. Stream-of-Consciousness Technique

Joyce uses novelistic techniques such as the stream-of-consciousness technique in structuring his sentences; most of which are grammatically innovative as they reflect the flexible and muddled nature of human thinking. In *Proteus*, the concentrated philosophism of such epithets as "Ineluctable modity of the visible" reflects the stream of consciousness and non-linearity of the protagonist's thoughts. In the same way, Molly Bloom's soliloquy in *Penelope* also loses the normal punctuation, and contains ideas flowing one after the other such as "yes because he never did a thing like that before as ask to get his breakfast in bed with a couple of eggs.

The semantic analysis performed with the help of AI proves that such grammar features are in fact central to Joyce's themes of consciousness. In defiance of traditional grammar, therefore, Joyce vividly captures the character's inner worlds and stress on the fluidity and richness of their thinking processes.

3. Creation of Atmosphere and Mood

The use of the unnatural grammar is also central in the creation of the particular atmosphere and the mood of various chapters. In *Circe* such realistic-sounding but elaborated description as 'On her flowing yellow hair a wealth of sea flowers of silk and silver' give the chapter an hallucinatory fairy-tape feel in the novel. The syntactic preference described above is revealed as a stylistic feature through which an AI analysis of the text would pick out as adding to the vividness of the given passages. Likewise in *Hades* the imagery of structures 'Desolation. Gray horror seared his flesh' in the unadorned manner amplifies the sombre picture of a

funeral procession. It is important to mention these grammatical options not only contribute to the development of the plot but also arise from each chapter's topic, proving that Joyce knows how to manipulate language to elicit certain feelings.

4. Speculative thinking and literary genre

In terms of linguistic innovation, Joyce's writing might be characterized as experimental, due to the abundance of what can be properly described as *nerd* words, as well as non-standard syntax. Thus, compound new formations 'Seabedabbled, fallen welkin, dewfall', used in *Scylla and Charybdis*, are deviations from standard morphological processes which introduce a poetic connotation to the words and augment the tragic mystique. The fact that these structures are identified in the AI model shows that Joyce's writing experiment with language as a means of venturing into new territory of literature.

In *Oxen of the Sun* the avant-garde and poetic inversion before born babe bliss had draws upon historical prose techniques, in addition to similar to other techniques discussed above this demonstrates Joyce's interest in the development of language and the related issues with birth and creation. The analysis performed by the AI system also demonstrates that these are the formal experimentalism, which is an essential part of Joyce's aesthetic and the negation of the conventions of narrative realism.

5. Contrast with Conventional Structures

Such peculiar patterns as gender shifts meshes with much more typical narrative forms in cyclops or even *eumaeus* help to further declare style variety in *ulysses*. In *Cyclops*, one could hardly find a single ambiguous string of words; the simple statement 'A nation is the same people living in the same place', which opposes the intricacy of the majority of chapters, emphasizes satirical and parodic tones of the work. The syntax of *Eumaeus* is more home spun and straightforward in contrast to the realistic style of representation of *Circe* episode that immediately precedes *Eumaeus*, and the phrase "Sitting pretty on the bench she nibbled a seedcake" is conversational and illustrates Joyce's capability to use formal language as well as the low colloquial.

This paper examines the most common Un Natural Grammatical Structures (UNGS) that are present in James Joyce's *Ulysses*.

The major irregularities in the syntactic structure in James Joyce's *Ulysses* are the fragments, the flowing pattern of consciousness, unconventional punctuation and word order. Joyce often ignores standard grammar and punctuation norms in order to convey the process of character's thinking and perceiving. In general, such structures may be defined with the help of deviations from the syntactic norms of a particular language, for example, concrete constructions containing no agents or verbs, numerous uses of ellipses, and switches in tense or points of view. For instance, in the "Proteus" episode, Joyce practices the stream of consciousness to capture the protagonist's thinking process; thus, the received sentences practically have no grammatical structure. These unnatural grammatical structures are vital to the style of the book and the themes within *Ulysses*.

Resorting to these stylistic patterns is pivotal to Joyce's blending of grammar to develop the themes. A number of criticisms of Rushdie's style can be made: they refer to the postmodernist attitude to human consciousness which is described as fragmented and chaotic. When abandoning the grammar norms, Joyce overloads readers with characters' thoughts, which in turn enriches the concepts of subjectivity, identity, and Time. For example, episode's shot called "Penelope" uses stream of consciousness technique, which is expressed by the lack of punctuation in the text and free word order – it emphasizes themes like desire, memory and agency through the character of Molly Bloom. This stylistic method does not only culminate reader emotions towards the characters, but it also asks for active readers and denies the reader the passivity of a regular, simple plotline.

Despite such conditions, are AI and methods of natural language processing capable of identifying and categorizing works of literary prose that contain non-standard grammatical formations like the ones employed in James Joyce's *Ulysses*?

Optical character recognition (OCR) and natural language processing (NLP) methods cannot go wrong in defining prognostications for the classification of non-standard grammar construction like the ones in *Ulysses*. Automated systems like

syntactic parsers and machine learning algorithms, can actually be trained to detect 'odd' occurrences in text which are grammatically unconventional. However, this enhances the quality and scope of the training information besides the capability of the algorithms applied in the technology. Despite the aspect of utilizing the volume of text and the characteristics of non-standard recognition in the workflow, certain features of literary language and, in particular, the translation of James Joyce's style remain intricate. Hence when it comes to the initial recognition and sorting, AI comes in handy, but when it comes to analysis based on the context, then experience really can help.

What aspects of runs can an AI analysis reveal that cannot be identified with a variation of the standard techniques of textual analysis?

First, the analysis using AI can produce several results that would not be easily identifiable by a literary analysis. Firstly, AI is able to learn from a large amount of text data and perform analysis of the patterns and trends in the text consistent with the rest of the corpus at hand which may become difficult for human analysis. For instance, the techniques such as topic modeling and sentiment analysis will find out entries and sentiments throughout *Ulysses*.

Secondly, while appreciating a text, AI is aware of slight changes in syntax and lexicon, thus giving minute details of the style adopted by Joyce.

Finally, with the help of AI, such comparative analyses can be performed, with the help of which scholars can compare *Ulysses* to other texts and demonstrate various aspects and significant features of general trends in literature. These capabilities enhance what one can refer to as the 'scope' of literary analysis by adding new, evidence-based perspectives to those of yore.

What is the impact of the unnatural grammatical structures in relation to the discussed term identified on the reader's interpretation and the reader engaged with the text?

The elements of the absurd in the grammatical structures as elements of *Ulysses*' text impact the further interpretation and reception by readers. These structures include features and aspects that seem to call for readers' greater and more conscious engagement, particularly in the process of interpreting and making sense of Joyce's writing. Diocletian's immoral writing instrumentality can

provide a result of confusion and perplexity in terms of syntax and punctuation to raise the feeling of psychological confusion within the audience. This engagement might enhance the readers' emotional and intellectual investment in the narrative and ideas presented in the text since the reader is trying to find meaning in apparently unrelated scenes. However, accessing the information may be quite difficult at times due to its distinguished and rather unusual writing style, thus may cause disinterest from the readers who are not conversant with avant-garde literary devices. In sum, these examples of grammatical progress help the reader to enter the flowing of the text more closely and actively, thus improving the understanding of Joyce's artistry.

Conclusion

This study, which applies AI computational text analysis to analyze unnatural language in James Joyce's *Ulysses*, will demonstrate the correlation between experiments in stylistic devices and the advancement of the narrative and thematic elements in the novel. The analysis reveals that Joyce's use of unconventional syntax, neologisms, and fragmented structures serves multiple purposes: improving characterization, developing more realistic and fluid plot and the use of contemporaneous style, building realistic settings, and symbolism. In this way, by providing an account of and, it can be argued, proving the meaningfulness of these grammatical deviations, the study demonstrates Joyce's radical reinterpretation of language and the principles of narrative. With the help of AI, the findings about the experimental grammar are consistent with Joyce's ostracism of conventional organic intellectual forms and contribute to his portrayal of modernist literature.

Future Directions for Research

Further research can also use the Computational Linguistics Approach (CLA) for other texts of the modernist period like Virginia Woolf's novels or Marcel Proust's novel. It is possible to draw the evident differences between Joyce's innovations in grammatical structures and those of other authors, which will reveal certain details about the use of language and structure in works employed in the framework of modernist experiments. It is also suggested that the incorporation of multimodal

analysis, which integrates the analysis of text with that of visuals and audio can enhance the investigation. Analyzing how Joyce's grammatical structures are intertwined with typographical choices, visual layout, and potential audible aspects they may disclose other layers of meaning and stylistic specifics.

Analyzing how such violations have been perceived and interpreted by the translators/adapters of the work and how they impacted the target culture, especially the longest one as in the French context, could enlighten the reception of Joyce's specific stylistic choices. Thus, it is in such studies that the difficulties and innovative approaches to the translation of Joyce's experimental language can be described. When unnatural grammatical structures are being used or avoided differently across characters in *Ulysses*, it might offer a more intricate of how Joyce is characterizing. Further facets of Joyce's approach of presenting characters as speaking subjects could thus be detected by scrutinizing how the characters' linguistic conduct corresponds to their psychological disposition and function in the plot. Looking at the Joyce's grammatical structures evolution in the light of the general linguistic evolution and historic linguistics would consider more about his stylistic options. Comparing these structures to the current and past linguistic tendencies might shed light on the specifics of Joyce's approach in the general linguistic setting.

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