GENRE AND REGISTER IN MEDICAL RESEARCH ABSTRACTS: A SYSTEMIC FUNCTIONAL LINGUISTIC APPROACH

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Abstract: This study explores the genre structure and register realization of medical research abstracts through the lens of Systemic Functional Linguistics (SFL). Based on a corpus of 60 abstracts from six major medical disciplines published between 2017 and 2024, the study analyzes rhetorical staging and linguistic choices to uncover how meaning is constructed in this highly codified academic genre. The findings reveal substantial standardization across the corpus, with most of the abstracts following a simplified Introduction–Methods–Results–Discussion (IMRaD) structure and displaying standard features such as technical field realizations, nominalizations, low-modality expressions, and impersonal constructions. However, subtle disciplinary variations are noted in which Oncology abstracts emphasize contextual background more, while Pulmonology and Cardiology focus more on methods and results, highlighting the influence of field-specific epistemological priorities. These results affirm prior research in genre and discourse analysis and suggest that medical abstract writing requires structural conformity and rhetorical flexibility. Pedagogically, the study underscores the value of SFL-informed instruction in medical English writing courses, especially for non-native English-speaking scholars. Integrating genre- and register-based training could enhance abstract-writing competence and increase the international publication success of emerging researchers in contexts such as Vietnam.

Keywords: genre, register, medical abstracts, systemic functional linguistics, academic writing

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CẤU TRÚC THỂ LOẠI VÀ BIẾN THỂ NGÔN NGỮ TRONG CÁC BẢN TÓM TẮT NGHIÊN CỨU Y HỌC: TIẾP CẬN TỪ NGỮ PHÁP CHỨC NĂNG HỆ THỐNG

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Tóm tắt: Nghiên cứu này phân tích cấu trúc thể loại và sự hiện thực hóa ngữ vực/phong cách diễn ngôn (register) trong các bản tóm tắt nghiên cứu y học dưới góc nhìn của Ngữ pháp chức năng hệ thống (Systemic Functional Linguistics – SFL). Dựa trên một tập hợp gồm 60 bản tóm tắt thuộc 6 chuyên ngành y học chính, được công bố trong giai đoạn 2017-2024, nghiên cứu tiến hành phân tích trình tự tu từ và lựa chọn ngôn ngữ nhằm khám phá cách thức xây dựng ý nghĩa trong một thể loại học thuật có tính chuẩn hóa cao. Kết quả cho thấy phần lớn các bản tóm tắt tuân theo cấu trúc: Mở đầu - Phương pháp - Kết quả - Thảo luận (IMRaD) rút gọn, thể hiện các đặc điểm chung như: sử dụng thuật ngữ chuyên ngành, danh hóa, tính tình thái thấp, và lối viết phi cá nhân. Tuy nhiên, cũng có những khác biệt nhỏ giữa các chuyên ngành - ví dụ, chuyên ngành Ung thư học nhấn mạnh bối cảnh nghiên cứu, trong khi Hô hấp và Tim mạch tập trung vào phương pháp và kết quả, phản ánh ưu tiên nhận thức đặc thù của từng lĩnh vực. Những phát hiện này xác quyết kết quả các nghiên cứu thể loại trước đó, đồng thời cho thấy việc viết tóm tắt trong lĩnh vực y học đòi hỏi sự kết hợp giữa tính quy chuẩn và khả năng điều chỉnh linh hoạt. Về mặt sư phạm, nghiên cứu nhấn mạnh tầm quan trọng của việc tích hợp giảng dạy viết học thuật dựa trên thể loại và phong cách diễn ngôn theo định hướng SFL, đặc biệt đối với các nhà nghiên cứu y khoa không sử dụng tiếng Anh như ngôn ngữ thứ nhất. Cách tiếp cận này có thể giúp nâng cao năng lực viết tóm tắt và tăng khả năng công bố quốc tế, đặc biệt trong các bối cảnh như Việt Nam.

Từ khoá: thể loại, biến thể ngôn ngữ, tóm tắt nghiên cứu y học, ngữ pháp chức năng hệ thống, viết học thuật

1. Introduction

Medical research abstracts play a pivotal role in scholarly communication, particularly in health sciences, where the ability to convey clinical findings clearly and efficiently can significantly affect the dissemination and application of knowledge. As condensed and self-contained summaries of full-length articles, abstracts serve not only to inform potential readers of a study's main objectives and outcomes but also to promote the article for citation and wider readership. In the context of increasing research output and time-limited readership, the abstract often determines whether an article is read. Therefore, its linguistic precision, structural clarity, and disciplinary alignment are of utmost importance.

In medical contexts, where scientific language is inherently technical, and audience expectations are highly specialized, abstracts must fulfil communicative demands beyond simple summarization. They must present complex medical information accurately, assert the study's credibility, and conform to discipline-specific rhetorical norms. This makes medical research abstracts a highly constrained yet powerful genre that requires clinical and communicative competence. Despite this importance, relatively little attention has been paid to the linguistic mechanisms that underlie the construction of meaning in such texts, particularly from a functional linguistic perspective.

From the viewpoint of Systemic Functional Linguistics (SFL), language is a social semiotic resource used to make meaning in context (Halliday & Matthiessen, 2014). Within this framework, texts are seen not as isolated language products but as purposeful social processes realized through choices in genre and register. Genre refers to the staged, goal-oriented structure of a text type that reflects its communicative purpose (Martin & Rose, 2008), while register represents the linguistic configuration shaped by contextual variables: field (what is happening), tenor (who is involved), and mode (how the communication is carried out) (Eggins, 2004). Together, genre and register shape the structure, tone, content, and organization of academic writing.

When examined through this lens, research abstracts reveal rich insights into how scientific knowledge is constructed and conveyed. Within this study, *genre stages* are operationally defined as functionally distinct phases of meaning-making within a text, each characterized by a dominant communicative purpose in relation to the overall goal of the abstract. These stages are identified based on communicative function rather than formal section headings, and are recognized through recurring patterns of semantic focus and rhetorical work performed at each phase (e.g., contextualizing the research, stating the research aim, describing procedures, reporting findings, and indicating implications). Previous studies in genre analysis have investigated full research articles across disciplines. However, fewer have focused on the abstract as a standalone genre with distinct rhetorical and grammatical features, especially in medical research. Moreover, while studies in English for Academic Purposes (EAP) have examined medical writing challenges among non-native speakers, there remains a lack of research that applies SFL to uncover how genre and register interact in shaping the communicative patterns of medical abstracts.

This gap is particularly relevant in the Vietnamese context, where English remains a foreign language but is increasingly required in academic and professional domains. As an English lecturer at a military medical university in Vietnam, I have observed that even highly competent clinicians and medical students often struggle with producing effective abstracts in English. The difficulties extend beyond grammar and vocabulary, involving unfamiliarity with disciplinary genre conventions and register expectations. Although clinically sound, many abstracts submitted by Vietnamese researchers lack clarity in information sequencing, rhetorical purpose, or appropriate register, which reduces their acceptability in international journals. These observations and the limited availability of genre-based instruction tailored to medical writing motivated the current study.

Therefore, this study aims to investigate medical research abstracts' genre structure and register features from a functional linguistic perspective. Specifically, it applies the Systemic Functional Linguistics framework to examine how language is used strategically in abstracts published in peer-reviewed medical journals. The study seeks to identify patterns in rhetorical staging, the deployment of register variables, and how meaning is constructed to fulfil disciplinary communicative purposes.

The study contributes to academic discourse analysis and medical English pedagogy by addressing this gap. It provides empirical insights that inform the teaching of scientific writing for health professionals, predominantly non-native English speakers. The findings also serve as a reference for designing genre-based writing instruction in medical institutions, enhancing researchers' international visibility and publication success in developing contexts.

Drawing on professional experience teaching English for medical purposes at a Vietnamese military medical university, the study aims to uncover how language is functionally deployed to meet communicative demands within the medical academic community. In doing so,

it seeks to bridge the gap between theoretical genre/register analysis and practical challenges non-native English-speaking researchers face in constructing internationally publishable abstracts.

Beyond identifying recurring linguistic features, this study advances SFL-based research by examining how such features are systematically distributed and interact across genre stages and register variables in a cross-disciplinary medical corpus.

Given these considerations, the present study seeks the answers to the following research questions:

1. What are the common genre stages found in medical research abstracts published in peer-reviewed international journals?

2. How are register variables, field, tenor, and mode, realized in these abstracts to reflect disciplinary communicative purposes?

A review of the relevant literature on genre and register in medical abstracts will now be presented to ground the research questions within existing scholarship.

2. Literature Review

2.1. Introduction to Research Abstracts as a Genre

Research abstracts have long served as a vital entry point into scientific articles, especially in medicine, where efficient communication of complex clinical information is critical. More than a summary, the abstract functions as a self-contained academic text with communicative purposes, introducing the topic, stating the aim, outlining the methods, and highlighting the key results and conclusions. In highly specialized disciplines like medical research, a well-written abstract can significantly influence whether the full article is read, cited, or even taken seriously by peers.

Given the volume of publications and the limited readers' time, abstracts often stand as the only accessible part of a paper on academic databases or search engines. As such, they play a strategic role in shaping a study's visibility and perceived credibility. This makes writing abstracts a technical task and a rhetorical challenge: how to distil the essence of a study into a few hundred words while conforming to the expectations of a global, expert readership.

In recent decades, research in genre analysis has increasingly recognized the abstract as a distinct academic genre with its structural conventions. Swales (1990) laid the groundwork with his CARS model (Create a Research Space), which, although initially designed for introductions, paved the way for rhetorical move analysis in other parts of research articles, including abstracts. Building on that, Hyland (2000, 2004) examined move structures across disciplines and proposed several functional stages commonly found in abstracts: background, purpose, method, results, and conclusion.

These insights have shown that abstracts are not neutral or purely informative texts. They are purposefully constructed to meet the communicative needs of specific academic communities. In medical writing, where precision, conciseness, and adherence to disciplinary norms are highly valued, understanding the genre-specific characteristics of abstracts becomes especially important, particularly for non-native English-speaking scholars aiming to publish in international journals.

2.2. Genre Analysis in Academic Writing

The study of academic writing from a genre-analytic perspective has expanded markedly over the past three decades, offering a systematic framework for understanding how texts operate

within specific discourse communities. Genres are viewed not simply as text types but as socially recognized ways of using language to achieve particular communicative purposes shaped by disciplinary practices and values (Swales, 1990).

A core assumption of genre analysis is that genres are staged and organized through predictable rhetorical moves that guide writers in structuring information for their academic audiences. Extending this view, Bhatia (1993) argued that genre knowledge is both cognitive and social, requiring awareness of textual organization as well as the contexts in which texts are produced and interpreted.

Academic abstracts typically follow a recognizable move structure, including establishing the research territory, stating aims, outlining methods, reporting results, and sometimes drawing conclusions or implications. These moves reflect conventions of scholarly communication and vary across disciplines. Hyland (2000) demonstrated that social science abstracts tend to provide more justification and background, whereas those in the natural sciences foreground methods and results.

Beyond structural stages, genre analysis also addresses interpersonal and evaluative meanings. Martin and White's (2005) appraisal framework illustrates how writers construct stance and credibility through resources such as hedging and modality, features that are particularly consequential in high-stakes genres, such as medical research abstracts.

Recent work by Melliti (2024) comparing human-written and AI-generated abstracts shows that, although AI texts generally conform to expected move structures, they often lack the contextual richness and argumentative depth found in human writing. Similarly, Wang et al. (2023) highlighted the pedagogical value of genre awareness in thesis abstract writing and advocated wider use of genre-based instruction, especially for non-native English writers.

2.3. Systemic Functional Linguistics (SFL): A Framework for Analyzing Genre and Register

Systemic Functional Linguistics (SFL), developed by M.A.K. Halliday and further elaborated by scholars such as Matthiessen, Martin, and Eggins, is a socially oriented theory of language that views linguistic choices as purposeful responses to social context. Rather than focusing solely on formal structures, SFL emphasizes the relationship between language, meaning, and context, treating language as a resource for meaning-making in specific communicative situations.

Central to SFL are three metafunctions of language: the ideational metafunction, which construes experience and logical relations and is associated with the register variable of field; the interpersonal metafunction, which enacts social relationships, attitudes, and evaluations, corresponding to tenor; and the textual metafunction, which organizes discourse coherently and cohesively, linked to mode. Together, the variables of field, tenor, and mode define register, described by Eggins (2004) as the typical configuration of meanings associated with a particular situational context. In contrast, genre refers to staged, goal-oriented social processes through which texts unfold to achieve specific communicative purposes (Martin & Rose, 2008).

Genre and register are closely interconnected. While genre shapes the overall organization and sequencing of communicative stages (e.g., purpose, method, results, and conclusion in research abstracts), register governs the linguistic choices realized within each stage. This integrated framework provides a comprehensive lens for examining how social purpose and contextual demands shape academic texts.

This perspective is particularly relevant to medical research abstracts, a highly conventionalized and information-dense genre governed by strict disciplinary norms. An SFL-informed approach allows researchers to identify typical genre stages, examine how linguistic

resources, such as process types, participant roles, modality, nominalization, clause complexity, and thematic organization, realize the register variables of field, tenor, and mode, and assess alignment with expectations of medical scientific communication.

Recent studies highlight the pedagogical and analytical value of SFL-based genre analysis. Wang et al. (2023) emphasize that genre-based instruction grounded in SFL helps non-native English writers develop both structural awareness and register sensitivity in disciplines such as medicine. Melliti (2024) similarly demonstrates that, although AI-generated abstracts often conform to expected move structures, they lack the rhetorical depth and contextual richness characteristic of human-authored texts.

Within the broader SFL tradition, extensive research has examined academic genres such as research articles, introductions, dissertations, and case reports, demonstrating the framework's ability to link linguistic form with social function. However, recent work suggests that interactions between genre structure and register variables remain insufficiently explored at the abstract level. Cheng (2023) notes that while ideational meanings in scientific texts have been widely studied, interpersonal resources related to stance and authorial positioning receive comparatively little attention, despite their importance in medical abstracts where claims must balance caution, credibility, and persuasion. From a theoretical standpoint, Doran et.al. (2024) propose a dynamic model of context in which genre and register interact in context-sensitive ways, supporting analyses that integrate macro-level genre progression with micro-level linguistic realization.

Overall, these studies indicate that SFL provides a powerful framework for analyzing medical research abstracts as structured, meaning-making texts shaped by both generic conventions and contextual demands. Nevertheless, existing research often focuses on either broader academic genres or isolated metafunctional features, leaving medical research abstracts insufficiently examined through a fully integrated SFL lens.

2.4. Summary of Literature Review and Identification of Research Gaps

The reviewed literature demonstrates that Systemic Functional Linguistics has been widely adopted to investigate academic discourse, yielding valuable insights into how language realizes social purposes through genre and register. Foundational theoretical contributions (e.g., Cheng, 2023; Doran et al., 2024) have clarified the complex interaction between genre staging and register configuration, while empirical studies (e.g., Wang et al., 2023; Melliti, 2024) highlight the pedagogical and analytical relevance of SFL-informed approaches to academic writing.

Despite these advances, several significant gaps remain. First, relatively few studies have treated medical research abstracts as an independent genre warranting systematic analysis in their own right. Existing research has more often examined full-length research articles or broader academic genres, with abstracts receiving limited focused attention.

Second, prior studies rarely adopt a fully integrated SFL framework that simultaneously examines genre structure and all three register variables — field, tenor, and mode — within the same analytical design. As a result, the interaction between rhetorical staging and lexicogrammatical choices in medical abstracts remains under-theorized and under-documented.

Third, research contexts have been predominantly Western, with limited attention paid to abstracts authored by non-native English-speaking scholars. In the Vietnamese context, existing SFL-based studies (e.g., Nguyen, 2019; Nguyen, 2023) have focused primarily on clinical discourse and case reporting, rather than on medical research abstracts prepared for

international publication. Consequently, the specific linguistic and rhetorical challenges faced by Vietnamese medical researchers remain insufficiently explored.

To address these gaps, the present study applies a comprehensive SFL-based analytical framework to medical research abstracts, examining both genre structure and register realization across disciplinary contexts. By doing so, it aims to generate empirically grounded insights that contribute to academic discourse analysis and inform genre-based instruction for medical professionals and researchers in Vietnam.

3. Methodology

3.1. Research Design

This study employs a qualitative discourse analysis framework grounded in Systemic Functional Linguistics (SFL). Rather than focusing solely on surface linguistic features, it seeks to uncover how language choices in medical research abstracts realize deeper communicative purposes within an academic genre.

The SFL perspective conceptualizes texts as socially situated, goal-directed activities (Halliday & Matthiessen, 2014), making it particularly appropriate for analyzing how genre structures and register variables shape the communicative effectiveness of medical abstracts.

3.2. Data Collection

3.2.1. Corpus Selection

The corpus consists of 60 medical research abstracts purposively selected from leading international journals published between 2017 and 2024, including The Lancet, BMJ Open, Chest, and Journal of the American Medical Association (JAMA), all indexed by Scopus and/or Web of Science. The corpus is evenly distributed across six major medical disciplines, with 10 abstracts drawn from each:

+ Pulmonology (Respiratory Medicine)

+ Cardiology (Cardiovascular Medicine)

+ Infectious Diseases

+ Oncology (Cancer Research)

+ Neurology

+ General Internal Medicine

Selection criteria were carefully established to ensure corpus relevance, consistency, and disciplinary diversity:

+ Only Original Research Articles were included. Abstracts summarizing empirical studies were prioritized, excluding systematic reviews, meta-analyses, editorials, commentaries, and clinical guidelines.

+ Abstracts must be written in English to ensure linguistic comparability.

+ Each abstract must exhibit a recognizable academic structure (typically IMRaD: Introduction, Methods, Results, Discussion) or accepted variations.

+ Abstracts cover diverse empirical studies within the selected medical specialities, including clinical trials and observational studies.

This sampling strategy allows the corpus to capture representative genres and register realizations across various sub-disciplines within medicine.

3.2.2. Dataset Descriptive Profile (Abstract Length)

Because abstract length is closely related to the allocation of rhetorical space and the realization of genre stages, the dataset was first profiled in terms of word count. Word counts were calculated for the abstract body text only, excluding article titles, author information, headings, keywords, references, and any structured subheadings displayed separately by journal platforms.

Table 1 reports the mean word count, range, and discipline-specific variation in abstract length across the six medical sub-disciplines (10 abstracts per discipline). This descriptive profiling provides a baseline for interpreting cross-disciplinary variation in genre staging (e.g., differential expansion of Background versus Methods and Results stages) without over-attributing such variation to rhetorical choice alone, given the influence of journal word limits and disciplinary conventions.

3.2.3. Justification of Data Size

The size of 60 abstracts was determined to balance cross-disciplinary coverage with the depth required for Systemic Functional Linguistics (SFL)-based qualitative coding. Because the unit of analysis in this study is the abstract as a complete text and its stage-by-stage genre and register realizations, rather than large-scale lexical frequency patterns, the study adopts an information-rich, comparative qualitative design.

The dataset was therefore structured into six disciplinary subsets (10 abstracts per discipline) to enable: (i) within-discipline consistency checks, (ii) cross-disciplinary comparison of genre-stage configurations and register realizations, and (iii) analytic feasibility for detailed manual functional coding and verification. Accordingly, the study aims to produce analytic generalizations regarding typical genre–register patterning within the selected disciplines and journals, rather than statistical generalizations to all medical research abstracts.

Table 1

Descriptive Statistics of Abstract Length (Word Count) Across Disciplines (N = 60)

Discipline (n = 10 each)	Mean (words)	SD (Standard Deviation)	Min–Max (range)
Pulmonology	267.4	82.1	164–475
Cardiology	336.2	81.4	216–512
Infectious Diseases	291.1	28.6	251–334
Oncology	323.7	56.9	238–411
Neurology	324.0	63.4	243–431
General Internal Medicine	307.3	44.8	241–367

Only original research abstracts were retained for analysis to ensure comparability of genre-stage realization across disciplines.

To provide an empirical overview of the dataset prior to genre analysis, descriptive statistics of abstract length were calculated for each discipline. As shown in Table 1, abstract length varies both within and across disciplines, with differences in mean word count and range reflecting disciplinary conventions regarding rhetorical space allocation. These variations are analytically relevant, as abstract length directly constrains the distribution and realization of genre stages.

Oncology abstracts (n = 10) were selected for analytic illustration due to their relatively high mean length (M = 323.7 words, SD = 56.9), which allows clearer observation of genre-stage realization and boundary ambiguity while remaining representative of the overall dataset.

3.2.4. Sampling Strategy

Purposive sampling followed Patton's (2015) principle of selecting *"information-rich cases"* that best illuminate the research focus. The selection prioritized abstracts exemplifying structured scientific communication, ensuring richness and relevance for detailed SFL-based analysis.

To provide an empirical overview of the dataset prior to genre analysis, descriptive statistics of abstract length were calculated for each discipline. As shown in Table 1, abstract length varies both within and across disciplines, with differences in mean word count and range reflecting disciplinary conventions regarding rhetorical space allocation. These variations are analytically relevant, as abstract length directly constrains the distribution and realization of genre stages.

To operationalize the purposive sampling strategy, abstract selection followed a set of clearly defined procedural criteria. For each discipline, abstracts were drawn from peer-reviewed, high-impact international journals indexed in Scopus and/or Web of Science, with priority given to journals ranked in Q1 or equivalent disciplinary tiers. Abstracts were restricted to the publication period 2017–2024 to ensure temporal consistency and relevance to current disciplinary writing conventions.

Within each discipline, eligible abstracts meeting the inclusion criteria were first compiled, after which ten abstracts were selected to reflect variation in study focus and methodological design rather than author or institutional prominence. No statistical randomization was applied, as the aim was not probabilistic representativeness but analytical representativeness in terms of genre-stage realization and register patterning. This controlled purposive procedure ensured transparency, comparability across disciplines, and suitability for qualitative SFL-based analysis.

3.3. Analytical Framework

The study applies a two-dimensional SFL-informed analytical framework:

3.3.1. Genre Structure Analysis

Abstracts are segmented into functionally defined genre stages, following the conceptualization of genre as a staged, goal-oriented social process (Martin & Rose, 2008). Genre stages are identified based on communicative function rather than formal section headings or positional cues.

To avoid treating genre-stage labels (e.g., Background, Objective, Methods, Results, Conclusion) as self-evident moves, the present study explicitly operationalizes genre stages using functional criteria, in line with the Systemic Functional Linguistics (SFL) view of genre. In this study, a genre stage is defined as a functionally motivated segment that contributes a distinct meaning-making role to the overall communicative purpose of the abstract, rather than a formal section label or a rhetorical "move" in the traditional sense.

Accordingly, genre-stage identification was guided primarily by communicative function, what the segment is doing in the unfolding text, with lexico-grammatical features serving as supporting evidence rather than sole determinants. This ensures that stage identification reflects functional staging rather than move-counting analysis.

Table 2 presents the functional criteria and boundary decision rules used to identify and differentiate genre stages in medical research abstracts.

Table 2

Functional Criteria for Genre-Stage Identification in Medical Research Abstracts

Genre Stage	Core Communicative Function (Functional Criterion)	Boundary Decision Rule (Functional Test)
Background	Establishes the research territory by construing relevance, significance, or a knowledge gap that motivates the study.	If the clause explicitly projects the study's aim or purpose, it is coded as **Objective**, not Background.
Objective	Specifies the study's purposive orientation, indicating what the study sets out to investigate, assess, or determine.	If the segment shifts from stating purpose to describing procedures, design, data sources, or analysis, it is coded as **Methods**.
Methods	Describes how the study operationalizes the objective, including design, participants/data, procedures, and analytic approach.	If the segment reports empirical outcomes or findings, it is coded as **Results**, even when methodological terminology is present.
Results	Reports key empirical findings that address the stated objective.	If the segment moves beyond reporting findings to interpret implications or significance, it is coded as **Conclusion**.
Conclusion	Interprets findings and foregrounds the main takeaway, contribution, or implication of the study.	Purely descriptive restatements of results without evaluative or implicative meaning remain coded as **Results**.

Because medical research abstracts are highly compressed, adjacent genre stages, particularly Background–Objective and Objective–Methods, may co-occur within a single sentence. In such cases, coding followed a communicative priority principle: the genre stage assigned corresponds to the function that is rhetorically foregrounded in the clause (e.g., purposive projection-Objective; procedural specification- Methods), even when contextual or technical information is also present. This principle enables consistent handling of overlapping cases while maintaining alignment with SFL functional staging.

3.3.2. Register Analysis

Within each genre stage, linguistic resources are analyzed in terms of:

+ Field: Processes (verbs), participants (nouns), and circumstances (prepositional phrases, adverbials).

+ Tenor: Interpersonal strategies, including modality (e.g., may, might), appraisal resources (e.g., evaluative adjectives), and stance markers.

+ Mode: Textual organization, including thematic progression, reference cohesion, and conjunctions.

Analytical categories are adapted from established SFL coding frameworks (Eggins, 2004; Martin & Rose, 2008; Cheng, 2024), allowing discipline-specific flexibility while ensuring analytical consistency.

In addition to qualitative description, register analysis in this study was conducted as a stage-sensitive and pattern-based examination of systemic choices. Specifically, Field, Tenor, and Mode features were coded at clause level and then summarized quantitatively (frequency and percentage) across (i) disciplines and (ii) genre stages (Background, Objective, Methods, Results, Conclusion). This allows the analysis to move beyond "what is present" to "how choices pattern systemically", by (a) comparing distributions of key features, (b) identifying systemic contrasts across stages and disciplines, and (c) examining how metafunctional choices

co-vary with genre staging (e.g., ideational choices clustering in Methods/Results, interpersonal choices clustering in Conclusion).

3.4. Data Analysis Procedure

The data analysis will be conducted through a systematic, three-phase process:

- Phase 1: Genre Stage Identification

Each abstract will be segmented into genre stages based on communicative function rather than formal section headings or positional cues.

- Phase 2: Register Realization Analysis

Register features will be identified and coded for each move:

+ Field elements (e.g., types of processes) are coded at the clause level.

+ Tenor features (e.g., modality, stance) are categorized across abstracts.

+ Mode patterns (e.g., thematic development, cohesion) are mapped through the texts.

- Phase 3: Cross-Textual Pattern Analysis

NVivo qualitative analysis software will organize and support coding, thematic identification, and pattern recognition. Cross-abstract comparisons will be performed to identify recurrent rhetorical and linguistic patterns, variations across specialities, and any deviations from expected academic genre norms. Due to the compressed nature of medical research abstracts, particularly in oncology where multiple technical variables are often introduced early, boundaries between genre stages were occasionally ambiguous. One recurrent ambiguity involved sentences combining contextual framing with explicit research purpose.

For example, the sentence "*This study aimed to investigate the effect of couch rotation angles on non-coplanar VMAT plans for SBRT in lung cancer patients*" *contains references to clinical context but was coded as an Objective rather than Background, because the research aim is foregrounded through an explicit purposive construction ("aimed to investigate").*

In such cases, coding decisions were guided by communicative priority rather than lexical content alone. Ambiguous cases were discussed during coder calibration to refine distinctions between closely adjacent stages, particularly Background–Objective and Methods–Results.

3.5. Reliability and Validity

To ensure the reliability of the coding process, a second coder with training in Systemic Functional Linguistics independently analyzed a randomly selected 20% subsample of the corpus (12 out of 60 abstracts) using the same analytical framework and coding criteria presented in Table 2. Inter-coder agreement was assessed using Cohen's Kappa coefficient (Cohen, 1960). The analysis yielded a Kappa value of 0.82, indicating substantial agreement according to the benchmark proposed by Landis and Koch (1977).

Residual disagreements primarily concerned boundary distinctions between closely related genre stages, particularly Background vs. Objective and Methods vs. Results, which are known to overlap in highly compressed medical abstracts. These cases were resolved through collaborative discussion, leading to iterative refinement and clarification of functional boundary rules, as summarized in Table 2. This process strengthened the consistency and replicability of the coding procedure across the full dataset.

In terms of validity, the study employed methodological triangulation by integrating genre structure analysis with register realization (Field, Tenor, and Mode). This multi-layered

analytical design allowed cross-validation of interpretive claims across structural and linguistic dimensions. In addition, reflective memoing and peer debriefing were used to document coding decisions and emergent patterns, enhancing analytical transparency and alignment with the Systemic Functional Linguistics framework.

3.6. Research Ethics

The study utilizes publicly available abstracts, so formal ethical approval is not required. Nonetheless, all abstracts will be cited appropriately, and no modifications will be made to the original texts. Anonymity will be maintained if excerpts are quoted in any published outputs.

4. Findings

4.1. Genre Structure Analysis

In interpreting the findings, cross-disciplinary claims in this study are framed as patterns observed within the defined dataset (six medical disciplines, abstracts published between 2017 and 2024), rather than as universal features of medical abstract writing.

Accordingly, all interpretive claims are grounded not only in qualitative exemplars but also through systematic quantitative distributional evidence across genre stages and register variables (Tables 3–6), enabling replicable tracing from coding decisions to observed cross-disciplinary patterns.

The analysis of 60 medical research abstracts drawn from six major sub-disciplines identified a relatively consistent genre structure across the corpus. The abstracts typically conformed to a simplified variant of the IMRaD model, comprising five key rhetorical stages: Background, Objective, Methods, Results, and Conclusion. Despite slight variations in the sequence or emphasis of stages, this overarching pattern was largely stable across disciplines, reaffirming the influence of conventional academic writing norms in biomedical research communication.

Table 3

Mean Proportional Distribution (%) of Genre Stages Across Medical Disciplines (N = 60)

Discipline (n = 10 each)	Background (%)	Objective (%)	Methods (%)	Results (%)	Conclusion (%)
Pulmonology	18.5	9.2	29.6	31.4	11.3
Cardiology	16.8	8.6	27.9	34.1	12.6
Infectious Diseases	19.8	7.5	28.9	31.1	12.7
Oncology	14.9	7.8	30.4	35.6	11.3
Neurology	15.7	8.1	31.2	33.0	12.0
General Internal Medicine	17.1	8.4	29.1	32.6	12.8

As shown in Table 3, clearer disciplinary contrasts emerge when rhetorical emphasis is examined quantitatively rather than impressionistically. Across all six disciplines, the Methods and Results stages consistently occupy the largest proportion of abstract space, jointly accounting for approximately 59% to 64% of the total text. For example, Pulmonology abstracts allocate 61.0% of their length to Methods and Results combined, while Neurology reaches 64.2%, underscoring the centrality of procedural transparency and empirical reporting across the corpus.

More fine-grained differences are visible at the level of individual stages. Cardiology Diseases and Oncology exhibit the strongest emphasis on the Results stage, accounting for 34.1% and 35.6% of abstract length, respectively, compared with 31.4% in Pulmonology and

31.1% in Infectious Diseases. This distribution reflects the outcome-driven orientation of these fields, where quantitative results and effect sizes are central to establishing clinical and scientific significance.

In contrast, Infectious Diseases abstracts allocate the largest proportion of rhetorical space to the Background stage (19.8%), followed by Pulmonology (18.5%) and General Internal Medicine (17.1%). This comparatively expanded contextual framing is particularly evident in abstracts addressing COVID-19-related research, where background information and situational justification are often foregrounded to contextualize urgent public health concerns. In several cases, the Background and Objective stages are functionally merged, contributing to the relatively low proportion of Objective across disciplines (7.5–9.2%).

General Internal Medicine abstracts demonstrate the most canonical realization of the IMRaD model, with all stages clearly delineated and proportionally balanced. Backgrounds are concise yet sufficient (17.1%), Objectives are explicitly stated (8.4%), Methods (29.1%) and Results (32.6%) are fully developed, and Conclusions (12.8%) are directly aligned with the stated aims. This distribution suggests strong adherence to conventional scientific writing norms within internal medicine research.

Across the corpus, broader regularities are also evident. Both Background and Conclusion stages remain relatively brief across disciplines, typically accounting for approximately 11–20% of abstract length, whereas Methods and Results dominate rhetorical space. This pattern reflects the epistemological priorities of biomedical science, where methodological rigour and empirical evidence are prioritized over extended contextualization or interpretive commentary within the abstract genre.

Furthermore, while most abstracts adhere to a linear progression through genre stages, limited variations are observed, such as Results preceding Methods in a small number of urgent Infectious Diseases studies or Objectives embedded within extended Background sections. Although infrequent, these deviations are quantitatively minor and do not disrupt the overall distributional patterns shown in Table 3, indicating controlled rhetorical flexibility shaped by contextual demands, disciplinary expectations, and journal conventions.

In sum, while the IMRaD-based genre structure remains remarkably robust across medical disciplines, Table 3 demonstrates that rhetorical emphasis varies systematically in degree rather than kind, reflecting differences in epistemic orientation, communicative priorities, and research dynamics across contemporary medical subfields.

4.2. Field

The discourse in the 60 medical research abstracts consistently reflects a highly technical and discipline-specific field, characterized by dense encoding of empirical activity and clinical outcomes.

Table 4

Distribution of Key Field Features Across Medical Abstracts (N = 60)

Field Feature	Mean Proportion / Frequency	Observed Pattern
Material processes	68–74% of all process types	Dominant in Methods & Results
Relational processes	16–21%	Concentrated in Background
Mental processes	<5%	Rare, mainly evaluative
Technical nominalizations	High density (avg. 3–5 per sentence)	Especially in Results

Circumstantial elements (time/place/manner)	Low frequency (<1 per sentence)	Mostly embedded in Methods
Generalized participants (e.g., patients, samples)	Predominant (>85%)	Across all disciplines

* Note: Frequencies represent mean distributions observed across 60 abstracts. Percentages are approximate ranges reflecting cross-disciplinary variation.

As summarized in Table 4, material processes constitute the dominant process type across the corpus, accounting for approximately 68–74% of all processes identified. These processes are heavily concentrated in the Methods and Results stages, where experimental procedures, clinical interventions, patient management strategies, and outcome measurements are foregrounded. Verbs such as *evaluate*, *administer*, *measure*, *assess*, *analyze*, and *treat* systematically encode biomedical research as a sequence of observable, actionable events, underscoring the fundamentally empirical orientation of medical science. Relational processes, by contrast, occur far less frequently (approximately 16–21%) and are primarily concentrated in the Background stage, where they function to establish conceptual relationships, disease characteristics, or associations between variables (e.g., *X is associated with Y*). Mental processes are rare (<5%), reflecting the genre's avoidance of subjectivity and personal cognition in favor of externally verifiable actions and states.

A further salient field feature is the high density of technical nominalizations, particularly in the Results stage, where an average of three to five nominal groups per sentence were observed. Complex procedural sequences and clinical outcomes are routinely condensed into compact noun phrases such as *viral load reduction*, *tumour response*, *stroke recurrence*, and *treatment efficacy*. This nominalization strategy enables writers to package multi-step actions into discrete conceptual units, thereby maximizing information density while maintaining textual economy.

Circumstantial elements providing details of time, place, and manner occur at relatively low frequency across the corpus (typically fewer than one per sentence). When present, they are most often embedded within the Methods stage (e.g., *during a 12-month follow-up*, *in tertiary hospitals*) rather than foregrounded. This minimization reflects the abstract genre's prioritization of core research actions and outcomes over contextual elaboration.

Participant roles are also highly generalized across disciplines, with over 85% of participants realized through generic labels such as *patients*, *subjects*, or *samples*. This generalization further depersonalizes the field of discourse, reinforcing the abstraction and generalizability of scientific claims and positioning individual studies within broader disciplinary knowledge frameworks.

Minor disciplinary differences are nonetheless observable. Oncology and Neurology abstracts occasionally exhibit more detailed field specification, particularly through references to genetic mutations or biomarker pathways, whereas Pulmonology and General Internal Medicine tend to foreground clinical conditions and intervention outcomes at a broader level. Importantly, however, these differences operate within a shared systemic pattern dominated by material processes, technical nominalization, and information compression.

In sum, the field of medical research abstracts is realized through a stable, systemically patterned configuration of linguistic choices, characterized by dominance of material processes, dense nominalization, minimized circumstantial detail, and generalized participants. These patterns confirm that field choices are not merely descriptive but are tightly aligned with the epistemological demands and communicative purposes of biomedical research.

4.3. Tenor

The realization of tenor across the 60 medical research abstracts consistently reflects a scientific interpersonal stance characterized by neutrality, caution, and depersonalization, all of which are central to the construction of credibility and objectivity in medical research communication.

Table 5

Distribution of Key Tenor Features Across Medical Research Abstracts (N = 60)

Tenor Feature	Mean Frequency / Proportion	Observed Pattern
Low-modality expressions (may, could, might, appears to)	High (approx. 1.8–2.4 per abstract)	Concentrated in Results & Conclusion
High-modality expressions (will, demonstrate, prove)	Very low (<0.3 per abstract)	Rare across corpus
Impersonal constructions (passive voice, it-extraposition)	Dominant (>75% of clauses)	Across all stages
First-person pronouns (we, our)	Minimal (<5%)	Occasionally in Methods
Explicit evaluative adjectives (important, significant, novel)	Rare (<0.5 per abstract)	Mostly avoided
Implicit evaluation (statistics, effect size emphasis)	Frequent	Especially in Results

* Note: Frequencies represent mean distributions observed across 60 abstracts; ranges reflect cross-disciplinary variation.

As shown in Table 5, low-modality expressions (e.g., *may*, *could*, *might*, *appears to*) occur with high frequency across the corpus, averaging approximately 1.8–2.4 instances per abstract. These expressions are particularly concentrated in the Results and Conclusion stages, where authors interpret findings and cautiously signal potential implications without overcommitting to causal claims. Such systematic use of low modality reflects a shared epistemic stance that foregrounds uncertainty, provisionality, and scientific prudence.

In contrast, high-modality expressions (e.g., *will*, *demonstrate*, *prove*) are extremely rare, occurring at fewer than 0.3 instances per abstract, underscoring a strong disciplinary norm against categorical or definitive claims in abstract writing. This asymmetry between low and high modality demonstrates a patterned interpersonal strategy rather than isolated stylistic choice.

Impersonal constructions constitute the dominant interpersonal resource across disciplines, accounting for over 75% of clauses. Passive voice structures (e.g., *data were collected*, *results were analyzed*) and extraposed constructions (e.g., *it was observed that*) systematically background authorial agency while foregrounding research procedures and outcomes. First-person pronouns (*we*, *our*) occur minimally (less than 5%), primarily in the Methods stage, indicating strong suppression of authorial presence across the genre.

Although evaluation remains a necessary component of scientific persuasion, explicit evaluative adjectives such as *important*, *significant*, or *novel* are rare (fewer than 0.5 instances per abstract). Instead, evaluative meanings are predominantly realized implicitly through statistical indicators (e.g., p-values, confidence intervals) and selective emphasis on outcome magnitude. This preference for implicit evaluation enables authors to position findings as noteworthy while maintaining a detached and objective tone.

Some disciplinary variation in tenor realization is nonetheless observable. Oncology abstracts exhibit slightly higher frequencies of low-modality expressions and cautious optimism, particularly in the Conclusion stage, reflecting the high-stakes and rapidly evolving

nature of therapeutic research. In contrast, General Internal Medicine abstracts display the most restrained interpersonal profile, with minimized modality and consistently impersonal phrasing, aligning with the field's focus on incremental clinical advancement.

Overall, the tenor of medical research abstracts is realized through a systemically patterned configuration of low modality, impersonal voice, and implicit evaluation, constructing an interpersonal relationship with readers based on epistemic caution, rational persuasion, and institutional authority. These patterns demonstrate that tenor choices are not merely stylistic preferences but are functionally aligned with the genre's communicative purpose.

4.4. Mode

The textual mode features observed across the 60 medical research abstracts demonstrate a highly standardized realization, reflecting the formalized, information-driven nature of scientific communication within the medical domain.

Table 6

Distribution of Key Mode Features Across Medical Research Abstracts (N = 60)

Mode Feature	Mean Frequency / Proportion	Observed Pattern
Nominal group density	High (avg. 4–6 per sentence)	Highest in Results
Clause compression (embedded clauses / reduced clauses)	Frequent (>70% of clauses)	Across all stages
Personal engagement markers (questions, directives)	Absent (0%)	None observed
Reference chains (this study, these patients, this cohort)	Frequent (1–2 per abstract)	Across stages
Logical conjunctions (however, therefore, in contrast)	Moderate (2–4 per abstract)	Mostly Results & Conclusion
Theme–rheme progression	Predominantly linear (>80%)	Stable across corpus
Dialogic elements	Absent	Fully monologic

* Note: Frequencies represent mean distributions across 60 abstracts; ranges reflect minor cross-disciplinary variation.

As summarized in Table 6, medical abstracts exhibit a consistently high level of information compression. Nominal group density is particularly high, averaging approximately four to six nominal groups per sentence, with the greatest concentration occurring in the Results stage. Complex processes, variables, and outcomes are routinely packaged into compact noun phrases (e.g., postoperative pulmonary complications, genetic predisposition, biomarker-driven stratification), enabling authors to maximize informational content within strict word limits.

Clause compression is likewise pervasive, with over 70% of clauses realized as embedded, reduced, or otherwise compressed structures. Rather than elaborating relationships through extended clause complexes, authors rely on condensed syntactic configurations that foreground information density over elaboration. This pattern reinforces the abstract genre's function as a highly economical vehicle for reporting research findings.

Cohesive resources are employed systematically to maintain textual coherence and logical progression. Reference chains such as this study, these patients, and this cohort occur regularly (approximately one to two instances per abstract), enabling efficient tracking of participants and research focus across stages. Logical conjunctions (e.g., however, therefore, in contrast) appear with moderate frequency (approximately two to four per abstract), primarily

in the Results and Conclusion stages, where relationships of contrast, causality, and inference are foregrounded.

Theme–rheme progression across the corpus is predominantly linear, with more than 80% of clauses moving from given information (theme) to new information (rheme). Initial themes typically reference the study, patient group, or primary variable of interest, ensuring continuity and cumulative development of meaning across the abstract.

Across all disciplines, abstracts adhere strictly to a written, informational, and monologic mode. No dialogic or reader-addressing elements (e.g., questions, directives, or subjective commentary) were observed, and personal engagement markers are entirely absent. This monologic stance underscores the genre's commitment to epistemic detachment and unidirectional knowledge transmission.

Minor disciplinary variation is nonetheless evident. Oncology and Neurology abstracts occasionally employ slightly more elaborate cohesive structuring, particularly when reporting multimodal treatment strategies or complex biomarker analyses. However, these variations do not alter the overarching mode configuration, which remains characterized by information compression, linear progression, and monologic exposition.

The mode of medical research abstracts is realized through a systemically patterned configuration of dense nominal groups, compressed clause structures, cohesive chaining, and linear thematic development, reinforcing the genre's communicative purpose of efficient, objective, and expert-to-expert information transfer.

Importantly, the contribution of the present analysis does not lie in identifying individual linguistic features that have already been documented in scientific discourse, such as IMRaD structuring, nominalization, or impersonality. Rather, its analytical value lies in demonstrating how these features pattern systematically across genre stages and register variables within medical research abstracts.

By combining genre-stage segmentation with systematic quantitative distributional evidence of field, tenor, and mode realizations, the study shows that well-established linguistic resources are not deployed uniformly across abstracts. Instead, they are strategically redistributed across rhetorical stages to fulfil discipline-specific communicative purposes. This stage-sensitive and register-mediated patterning extends prior SFL-based research, which has typically examined genre or register features in isolation.

5. Discussion

5.1. Interpretation of Key Findings

The analysis of the 60 medical research abstracts reveals that, despite disciplinary-specific nuances, there is a remarkable degree of convergence in terms of genre structure and register realization across fields. This striking uniformity suggests that medical abstracts, regardless of subfield, are strongly shaped by established conventions within the wider biomedical discourse community. These conventions are likely reinforced through journal submission guidelines, peer review expectations, and the need to communicate research findings efficiently and authoritatively to professional audiences.

One of the most prominent areas of convergence is the consistent application of a simplified IMRaD (Introduction, Methods, Results, Discussion) structure, which organizes information into clear, functionally distinct stages. Even when variations in emphasis or compression were observed, for instance, merging Background and Objective stages in urgent

COVID-19 studies, the fundamental logic of systematically presenting rationale, methodology, findings, and implications remained intact. This adherence underscores the medical discourse community's powerful standardizing influence in regulating what and how it is said.

Moreover, the findings highlight a consistent preference for technical processes, impersonal authorial stances, and highly compressed information structures across abstracts. The pervasive use of material processes (e.g., *"evaluate," "assess," "analyze"*), the depersonalized presentation of findings *("Data were collected...," "It was observed that...")*, and the dense packing of meaning through nominalizations collectively serve the communicative functions of medical abstracts. Specifically, they enable authors to convey complex research procedures and results in a highly succinct, objective, and authoritative manner, maximizing informational content within tight word limits while minimizing subjective bias.

Disciplinary nuances, while present, do not undermine this overall pattern of convergence but rather illustrate how genre conventions are flexibly adapted to accommodate the epistemological priorities of different medical subfields. For example, Oncology abstracts tended to place greater rhetorical emphasis on the Background stage, a reflection of the rapidly evolving nature of cancer research where establishing the context and significance of new interventions is particularly crucial. Similarly, Pulmonology and Cardiology abstracts focused on Methods and Results, aligning with the fields' strong clinical orientation toward intervention efficacy and outcome measurement.

These disciplinary adaptations suggest that while strong generic norms govern abstract writing in biomedical sciences, there remains room for localized rhetorical adjustments based on individual specialities' specific demands, research cultures, and knowledge production practices. This flexibility within a highly standardized framework enables medical researchers to meet the broader scientific community's expectations and highlight their subfield's particular contributions.

In summary, the findings demonstrate that the genre of medical research abstracts operates within a stable communicative template that facilitates clarity, efficiency, and credibility while allowing for subtle disciplinary tailoring that reflects the dynamic and heterogeneous nature of biomedical inquiry.

5.2. Comparison with Previous Studies

The findings of this study align closely with a significant body of prior research on academic abstract writing, particularly within the Systemic Functional Linguistics (SFL) framework. Studies by scholars such as Martin and Rose (2008) and Cheng (2024) have consistently emphasized three critical characteristics of scientific abstracts: the strategic use of compressed expression, the preference for cautious modality, and the prominence of depersonalization. The present analysis of 60 medical research abstracts across six disciplines reinforces these observations, demonstrating that these features are deeply entrenched within the communicative practices of the biomedical research community.

Specifically, the extensive use of nominal groups and condensed clause structures to achieve high information density mirrors Martin and Rose's (2008) assertion that academic discourse prioritizes efficiency and compactness to accommodate complex content within limited textual space. Similarly, the dominant employment of low-modality expressions and the systematic avoidance of overt authorial presence corroborate Cheng's (2024) findings regarding the need for epistemic caution and the construction of objectivity in scientific writing. Together, these features create a rhetorical environment in which claims are framed as provisional, empirical, and impersonal, aligning with broader norms of scientific argumentation.

Beyond affirming these earlier insights, the current study extends the understanding of academic abstracts by illustrating, *through systematic quantitative distributional evidence across genre stages and register variables,* how disciplinary-specific knowledge and epistemological priorities subtly influence rhetorical structuring, even within a highly standardized genre like the medical research abstract. For example, Oncology's emphasis on background contextualization and Pulmonology's focus on methodological elaboration demonstrate that while the overarching IMRaD framework is widely adhered to, the internal distribution of rhetorical weight varies according to the nature of inquiry and the communicative values of each field. This finding highlights the nuanced interaction between genre conventions and disciplinary epistemologies, suggesting that even rigidly codified genres allow for local adaptations that reflect the dynamic needs of specialized knowledge communities.

Moreover, the consistent realization of genre stages (Background, Objective, Methods, Results, Conclusion) and register variables (Field, Tenor, Mode) across diverse medical specialities provides empirical support for Eggins' (2004) observation that institutionalized genres enforce stable communicative practices across contexts. However, it also nuances Eggins' point by showing that stability does not equate to homogeneity; within the stable framework, variations emerge that accommodate field-specific rhetorical needs. Thus, the medical research abstract exemplifies the rigidity necessary for cross-disciplinary intelligibility and the flexibility required for disciplinary specificity.

In sum, while the present study validates foundational findings in genre and discourse analysis, it also contributes a finer-grained perspective on how standardized scientific genres are dynamically negotiated across fields, balancing universality with specialization.

6. Conclusion

Medical research abstracts can be understood as a highly regulated yet adaptive academic genre, shaped by strong standardization pressures alongside discipline-specific communicative priorities. Rather than functioning as fixed textual templates, abstracts operate as dynamic sites where genre conventions and register choices interact to construct credibility, manage epistemic caution, and foreground empirical value within strict space constraints.

Across medical disciplines, the recurrent convergence in genre staging and register realization suggests that biomedical abstract writing is governed by shared expectations concerning information density, impersonality, and methodological transparency. At the same time, systematic variation in rhetorical emphasis indicates that disciplinary epistemologies continue to influence how knowledge is positioned and justified within this standardized framework. This pattern supports a view of genre as a socially stabilized yet context-sensitive practice, allowing for controlled flexibility rather than uniformity.

From a broader theoretical perspective, the findings underscore the analytical value of an integrated SFL framework in explaining how linguistic choices pattern meaning at both macro-structural and micro-lexicogrammatical levels. Examining the interaction between genre stages and register variables offers principled insight into why particular configurations recur in successful medical abstracts.

More broadly, understanding these patterned interactions contributes to a deeper appreciation of how scientific knowledge is constructed, evaluated, and disseminated within global academic communities, particularly in contexts where English functions as an additional language.

Rather than merely reaffirming established characteristics of scientific writing, the study

demonstrates how these characteristics acquire analytical significance when examined through their patterned interaction across genre stages and register configurations

Acknowledgements

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