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Within-Discipline Variation in Medical Discourse: A Comprehensive Review of Lexical Bundle Use in Medical Research Articles and Medical Case Reports

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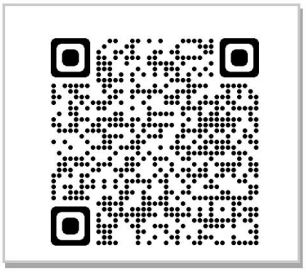


Abstract: This detailed review explores the pioneering study by Mbodj and Cortes (2025), which uses a corpus-driven approach to investigate variations in lexical bundle usage within two separate medical registers: Medical Research Articles (MRAs) and Medical Case Reports (MCRs). Utilizing a vast corpus of more than 2.2 million words, the study questions the traditional belief that linguistic differences in academic writing are solely determined by disciplinary boundaries. By systematically identifying and analyzing lexical bundles—commonly occurring word combinations that act as key elements of discourse—the research uncovers notable structural and functional distinctions between these medical registers, despite both belonging to the same field. This review brings together the study's methodological advancements, empirical findings, and theoretical insights, situating them within the larger context of register variation, research on formulaic language, and the analysis of medical discourse.

Keywords: *lexical bundles, register variation, medical discourse, corpus linguistics, formulaic language, academic writing*

1. Introduction

For many years, academic discourse analysis has concentrated on the connection between the limits of disciplines and variations in language. Historically, studies on specialized language have mainly centered on comparisons between disciplines, showing significant differences in linguistic characteristics among various academic fields. Nonetheless, new research indicates that the discipline itself might not fully account for linguistic variation patterns, especially when different registers within the same discipline are used for different communicative functions.

In their influential 2025 work, Mbodj and Cortes make a pivotal contribution to the evolving comprehension of lexical bundles in medical discourse through an extensive corpus-driven analysis. Their research fills a vital gap in the study of formulaic language by exploring variation within disciplines across two different medical registers: Medical Research Articles (MRAs) and Medical Case Reports (MCRs). This study questions existing beliefs regarding uniformity in academic discourse across disciplines and offers detailed insights into how specialized registers tailor linguistic resources to satisfy particular communicative needs.

The importance of this research is not limited to theoretical insights; it also has practical implications for medical education, academic writing guidance, and professional communication training. As medical discourse becomes more varied and changes over time, grasping the nuanced linguistic differences across various types of medical texts is becoming more crucial for successful professional communication and specialized language teaching.

2. Theoretical Framework and Literature Context

2.1 Lexical Bundles as Discourse Building Blocks

Lexical bundles, which are clusters of three or more words that commonly repeat in particular types of language, play a vital role in the study of formulaic language. Introduced by Biber et al. (1999), these phrases have become acknowledged as essential elements for producing fluid language, especially in academic and professional settings. Unlike ordinary collocations or idioms, lexical bundles are determined entirely through empirical, frequency-based approaches utilizing specialized corpus analysis software.

The basis for studying lexical bundles is rooted in the understanding that skilled language users frequently depend on ready-made expressions instead of creating every sentence from scratch with individual words. This view corresponds with broader theories on formulaic language, which highlight the widespread occurrence and significance of multi-word phrases in everyday language. Studies consistently show that formulaic expressions make up about 20-25% of both spoken and written language, underscoring the need to analyze them for thorough descriptions of register variation.

The research conducted by Mbodj and Cortes expands on the existing taxonomies for categorizing lexical bundles structurally and functionally, modifying these frameworks to suit the distinct nature of medical discourse. Their methodology illustrates a high level of sophistication in tackling the intricate relationship between methods that rely on frequency for identification and the analysis of functional context.

2.2 Register Variation Theory

The study's theoretical foundation is largely based on the principles of register variation theory, with significant influence from Biber and Conrad's 2019 work. Their approach defines registers as language varieties shaped by situational contexts. This framework highlights that linguistic features systematically group together in texts that serve similar

communicative functions, involve comparable participant interactions, and are produced under similar conditions.

Traditional register studies have generally concentrated on large-scale differences between spoken and written language or on comparisons across significant disciplinary lines. Nevertheless, the development of more detailed theoretical viewpoints acknowledges that registers can be found at various levels of specificity. Within disciplines, sub-registers may display unique linguistic characteristics that are shaped by their particular communicative purposes.

The medical field offers a perfect setting for exploring variations within a single discipline because of its diverse range of specialized texts that each fulfill unique professional and educational roles. Although MRAs and MCRs have similar disciplinary knowledge foundations and target the same professional audiences, they vary greatly in their communication goals, organizational formats, and rhetorical techniques.

2.3 Medical Discourse Studies

Research in medical discourse has traditionally emphasized cross-cultural variation, doctor-patient interaction patterns, and the evolution of medical writing conventions. However, systematic investigation of linguistic variation across different medical text types has received limited attention, despite recognition that different medical registers may require distinct linguistic resources.

The difference between MRAs and MCRs underscores key variations in how medical knowledge is constructed and shared. MRAs adhere to the conventional IMRD structure, showcasing research findings that are generalizable through meticulous experimental studies. Conversely, MCRs offer comprehensive narratives of single patient cases, focusing on diagnostic reasoning, treatment choices, and the educational insights gained from particular clinical interactions.

These functional variations impose varied linguistic requirements, possibly necessitating unique collections of formulaic expressions to suitably express meanings aligned with specific registers. The research by Mbodj and Cortes represents the initial thorough empirical analysis of these differences, viewed through the lens of lexical bundles.

3. Methodological Innovation and Corpus Design

3.1 Corpus Construction and Validation

The study by Mbodj and Cortes is noteworthy for its methodological precision, as it tackles various challenges involved in constructing specialized corpora. They assembled two large corpora: the Medical Research Article Corpus (MRAC), which includes 250 texts comprising 1,209,367 words, and the Medical Case Report Corpus (MCRC), which consists of 704 texts totaling 1,005,907 words.

The design of the corpus reflects meticulous consideration towards representativeness and quality assurance. For the MRAC, articles were chosen from five renowned medical journals (Science Translational Medicine, The Lancet, NEJM, JAMA, and JCI), guaranteeing high editorial principles and extensive medical coverage. Each article followed the standard IMRD organizational format, ensuring uniformity for comparative analysis.

The MCRC compilation necessitated more intricate validation processes because open-access publications often have inconsistent quality standards. To ensure that the texts met the established criteria for the medical case report genre, the researchers used consultations with expert informants and conducted systematic quality assessments. Focusing on the quality of the corpus enhances the dependability of future linguistic analyses.

3.2 Lexical Bundle Identification Procedures

The technical details of identifying lexical bundles introduce several methodological advancements that enhance corpus linguistics techniques. The researchers utilized the Lexical Bundles Identification and Analysis Program (LBiaP), which provides notable benefits compared to commonly used methods by removing overlapping bundles—an ongoing issue in analyzing bundles of various lengths.

The frequency thresholds utilized show a strategic adaptation to the characteristics of the corpus and the lengths of word bundles. Instead of using a single, consistent set of criteria, the researchers implemented differentiated thresholds: 3-4 word bundles required 20 occurrences per million words, whereas bundles of 7 or more words needed only 6. This method considers the inverse relationship between the length of a bundle and its frequency, while still ensuring statistical reliability.

A particularly innovative aspect of the methodology involves the distinction between lexical bundles and multiword collocations. The researchers established criteria to exclude expressions with multiple lexical words that function as dense noun phrases (e.g., "chronic obstructive pulmonary disease"), focusing on expressions that primarily consist of function words with discourse-organizing capabilities.

3.3 Situational Characteristics Analysis

The initial analysis of situational characteristics offers essential contextual support for understanding linguistic results. By utilizing a modified version of Gray's (2015) framework, the researchers methodically examined MRAs and MCRs across eight dimensions: participants, textual organization, setting, subject matter, purpose, data types, methodology, and the clarity of the research design.

This examination uncovered basic distinctions in communicative scenarios that elucidate later linguistic differences. Although both registers are aimed at medical professionals, Medical Case Reports (MCRs) also engage with medical students and patients, requiring language that is easier to understand. The experimental orientation of Medical Research Articles (MRAs) differs from the observational nature of MCRs, leading to varied needs in the description of methods and presentation of results.

The systematic documentation of situational differences provides theoretical grounding for interpreting functional variations in lexical bundle usage, strengthening the connection between contextual factors and linguistic choices.

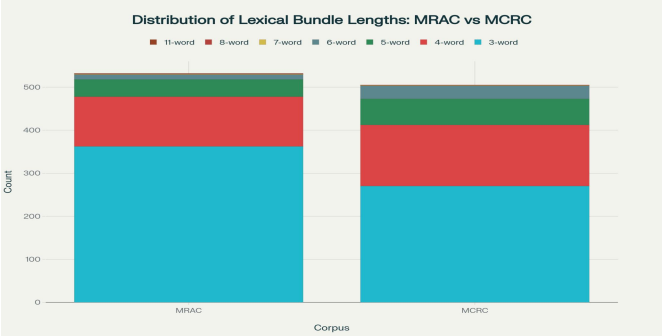
4. Empirical Findings and Analysis

4.1 Quantitative Distribution Patterns

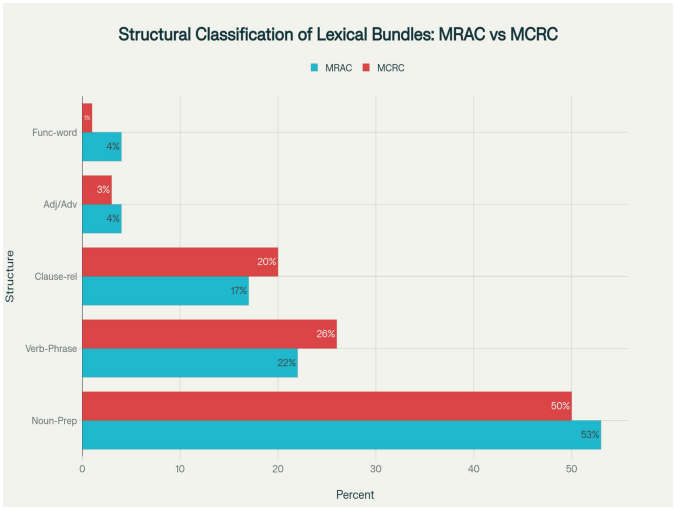
The quantitative analysis reveals striking patterns in lexical bundle distribution across the two medical registers. The MRAC yielded 533 bundles (3-11 words) while the MCRC produced 505 bundles (3-8 words), suggesting comparable reliance on formulaic expressions despite different text characteristics.

[97]

The distribution of bundles by length reveals intriguing differences between registers. Both corpora illustrate the anticipated inverse relationship between bundle length and frequency. However, the MCRC presents a more balanced distribution across 3-6 word bundles, unlike the MRAC, which heavily focuses on 3-word phrases. This trend indicates that MCRs might depend more on medium-length formulaic expressions, possibly due to their narrative focus and the necessity to depict intricate clinical situations.



The structural classification analysis indicates a notable resemblance in the primary categorical distributions across the two corpora. In both registers, noun phrase/prepositional phrase-related bundles are predominantly utilized (MRAC: 53%, MCRC: 50%), succeeded by verb phrase-related bundles (MRAC: 22%, MCRC: 26%) and clause-related bundles (MRAC: 17%, MCRC: 20%). These parallels imply common underlying discourse needs, despite their functional differences.



4.2 Structural Analysis and Register Characteristics

The in-depth structural examination uncovers subtle yet significant distinctions in the use of formulaic language between the two registers. The frequent use of passive constructions in both corpora contradicts recent claims about the diminishing use of passive voice in scientific writing, indicating that medical discourse retains unique grammatical preferences.

In MRAs, passive constructions are commonly found in research-related bundles that detail methodological procedures (e.g., "were randomly assigned to receive," "was performed using the"). These phrases highlight the genre's focus on methods that can be replicated and conventions for objective reporting. The use of passive voice highlights experimental procedures while adhering to established scientific writing norms that downplay the role of the author.

MCRs frequently use passive constructions, yet they often arise in distinct functional scenarios. Phrases such as "was diagnosed as having" and "was found to have" illustrate the observational aspect of clinical evaluations and the necessity to document diagnostic outcomes. In MCRs, the passive voice is used to highlight clinical discoveries rather than the methods employed.

The frequent occurrence of noun phrase/prepositional phrase fragments in both corpora highlights the informational density typical of medical discourse. These structures allow for the effective organization of intricate technical information, ensuring it remains accessible to professional readers.

4.3 Functional Classification and Communicative Purposes

The functional analysis reveals the most significant differences between the two medical registers. Using adapted taxonomies that reflect the distinct communicative purposes of each register, the researchers identified markedly different functional profiles.

4.3.1 MRA Functional Patterns

MRAs predominantly employ research-oriented bundles, accounting for 60% of 3-word and 56% of 4-word phrases,

indicative of the genre's main purpose of detailing systematic studies. Among these, descriptive expressions form the largest subgroup, featuring bundles such as "the most common," "the effect of," and "has been associated with."

The widespread use of procedure-focused phrases highlights the methodological focus fundamental to reporting in experimental research. Phrases like "were included in the," "was performed using," and "were randomly assigned to receive" aid in detailing research protocols accurately, thus allowing for replication and assessment of methodologies.

Text-oriented bundles in MRAs mainly act as signals indicating results and as framing tools, assisting in the organization of intricate experimental outcomes to enhance reader understanding. The recurrent use of phrases such as "these results demonstrate that" and "our data indicate that" highlights the genre's focus on conclusions grounded in evidence and logical reasoning.

4.3.2 MCR Functional Patterns

MCRs exhibit a distinctly different functional profile, with case-related bundles dominating across all bundle lengths (59-81% depending on length). This pattern reflects the genre's primary focus on individual patient presentations and clinical decision-making processes.

The analysis uncovers a number of new functional categories unique to clinical case reporting, such as bundles related to diagnosis and intervention, as well as expressions concerning decisions and outcomes. These categories include phrases like "the patient was started on," "differential diagnosis of," and "complete resolution of," which lack comparable equivalents in general academic writing.

The appearance of register-specific functional categories illustrates how unique linguistic needs arise within specialized professional settings, which standard classifications fail to address. This discovery holds significant consequences for both the theoretical insight into register variation and practical uses in teaching professional writing.

4.4 Convergent and Divergent Usage Patterns

The analysis of shared versus register-specific bundles provides crucial insights into within-discipline variation. Only 122 bundle types (less than 25%) appeared in both corpora, indicating substantial divergence despite shared disciplinary context.

Shared bundles predominantly serve general academic discourse functions rather than medical-specific purposes. Expressions like "at the time of," "as a result of," and "in the context of" perform temporal, causal, and framing functions common across academic genres. These findings suggest that disciplinary commonalities exist primarily at the level of general academic discourse features rather than specialized professional expressions.

The majority of register-specific bundles (around 75%) calls into question the notion of linguistic uniformity within disciplines and reinforces theoretical views highlighting the role of communicative purpose in influencing linguistic decisions. This trend implies that variations within a discipline might be as crucial as differences between disciplines in specialized academic settings.

5. Theoretical Implications and Contributions

5.1 Register Theory Development

The findings of Mbodj and Cortes offer significant theoretical contributions to the study of register variation. Their demonstration of considerable variation within disciplines questions simplistic models that view disciplines as uniform linguistic categories. Rather, the results endorse more sophisticated theoretical frameworks that acknowledge several levels of register specificity.

The research offers empirical evidence for theories that stress the importance of communicative intent in shaping linguistic decisions. The functional distinctions between MRAs and MCRs arise directly from their unique roles in building and spreading medical knowledge, demonstrating how situational elements take precedence over disciplinary similarities in influencing language use.

Discovering new functional categories unique to clinical case reporting enriches current classifications and highlights the necessity for bottom-up analytical methods that can adapt to linguistic innovations specific to certain registers. This methodological understanding carries wider significance for analyzing specialized discourse across various professional fields.

5.2 Formulaic Language Theory

The research adds to the understanding of formulaic language theory by showing how the specific communicative needs of different registers lead to unique patterns in the use of multi-word units. The development of diagnosis/intervention-related clusters in MCRs highlights how professional practices impose particular linguistic demands that broader classifications fail to encompass.

The discovery that shared bundles mainly fulfill general discourse roles, while register-specific bundles cater to specialized professional demands, backs theoretical models that differentiate between fundamental academic literacy characteristics and domain-specific language skills. This differentiation holds significant implications for teaching academic writing and training in professional communication.

The strides in identifying and classifying bundles represent a significant advancement in corpus linguistics methodology. These methodological innovations tackle ongoing technical issues without compromising theoretical integrity. By distinguishing between lexical bundles and multiword collocations, researchers gain more precise operational definitions for upcoming studies.

5.3 Medical Discourse Theory

The research significantly advances medical discourse analysis by offering the first thorough empirical examination of

linguistic differences across various medical text genres. By systematically documenting the structural and functional distinctions between MRAs and MCRs, it lays the groundwork for a more detailed understanding of medical communication practices.

The recognition of register-specific functional categories sheds light on the linguistic tools needed for successful clinical communication, offering valuable insights for medical education and professional advancement. Grasping these differences can guide curriculum development and evaluation methods in medical writing education.

6. Methodological Contributions and Innovations

6.1 Corpus Design and Quality Control

The study demonstrates several methodological innovations in specialized corpus construction. The systematic application of situational characteristics analysis to guide corpus collection ensures theoretical grounding while maintaining empirical rigor. This approach could serve as a model for other specialized domain investigations.

The attention to corpus quality through expert informant consultation and systematic validation procedures addresses persistent challenges in academic corpus construction. The researchers' strategies for balancing representativeness with quality control provide practical guidance for future corpus development projects.

6.2 Analytical Framework Development

The adaptation and extension of existing taxonomies to accommodate register-specific linguistic features represents a significant methodological contribution. The development of functional categories specific to clinical case reporting demonstrates the importance of bottom-up analytical approaches in specialized discourse analysis.

The integration of frequency-based identification procedures with contextual functional analysis illustrates effective strategies for combining quantitative and qualitative methods in corpus linguistics research. This integrated approach strengthens both the empirical reliability and theoretical relevance of findings.

6.3 Technical Innovations

The use of LBiaP software and the development of discriminated frequency thresholds address persistent technical challenges in multi-length bundle analysis. The systematic elimination of overlapping bundles and the distinction between lexical bundles and multiword collocations provide clearer operational procedures for future research.

The establishment of criteria for excluding context-dependent expressions and proper nouns demonstrates practical solutions to common corpus analysis problems while maintaining focus on discourse-functional expressions.

7. Pedagogical Applications and Professional Development

7.1 Medical Writing Instruction

The results of the study are immediately applicable to teaching medical writing. By identifying lexical bundles specific to each register, the study offers clear linguistic targets for teaching both MRA and MCR writing. Grasping these differences can aid medical students and practitioners in cultivating suitable register awareness and production skills.

The systematic documentation of functional differences between registers supports development of targeted instructional materials that address specific communicative requirements. Rather than treating medical writing as a homogeneous skill set, educators can develop differentiated approaches that acknowledge distinct register demands.

7.2 Academic Writing Support

The study's implications extend beyond medical education to broader academic writing support contexts. The demonstration of within-discipline variation challenges assumptions about disciplinary writing consistency and supports more nuanced approaches to discipline-specific writing instruction.

The identification of shared versus register-specific linguistic features provides guidance for curriculum design that distinguishes between core academic literacy skills and specialized professional competencies. This distinction can inform both course design and assessment practices.

7.3 Professional Communication Training

For medical practitioners, grasping the patterns of register-specific lexical bundles can enhance communication efficiency in various professional settings. Recognizing the linguistic characteristics that separate research reporting from clinical case presentations can boost both written and verbal communication abilities.

The study's findings also have implications for medical editing and publication support services. Understanding register-specific linguistic expectations can improve editorial decision-making and author guidance practices.

8. Limitations and Future Research Directions

8.1 Corpus Scope and Representation

Although the study offers important insights into the variation of lexical bundles within medical discourse, it does have some limitations that point towards areas for future research. By concentrating on English-language texts from prestigious journals, the study may not fully capture the diversity of medical discourse practices, especially in non-Western environments or publications of lower status.

Focusing solely on written texts overlooks key spoken forms of medical communication, like case presentations, clinical consultations, and educational interactions. Future studies might expand the analytical framework to investigate the use of lexical bundles in spoken medical language.

8.2 Longitudinal and Developmental Perspectives

The research offers a synchronic examination of present-day practices but does not explore the historical progression or

continuous changes in the conventions of medical discourse. Analyzing the usage of lexical bundles over time could uncover how medical registers adapt to technological advancements, professional developments, and social shifts.

Exploring the developmental trends in medical writing skills may offer valuable insights for educational assessments and curriculum planning. By examining the differences in lexical bundle usage between novice and expert medical writers, we can enhance instructional strategies and professional growth initiatives.

8.3 Cross-linguistic and Cultural Variation

The emphasis on English-language medical discourse restricts its applicability to other linguistic and cultural settings. A comparative study of lexical bundle patterns in medical discourse across various languages might uncover features of medical communication that are either universal or specific to individual languages.

Investigation of cultural variation in medical discourse practices could provide insights relevant to international medical education and cross-cultural professional communication contexts.

8.4 Register Expansion and Diversification

The research explores two significant medical registers, yet it does not cover the entire spectrum of medical discourse practices. Future investigations might expand the analytical model to encompass additional medical text types like patient information materials, regulatory documents, educational texts, and digital health communications.

The emergence of new medical communication technologies and practices suggests ongoing register diversification that could benefit from systematic linguistic investigation.

9. Broader Implications for Applied Linguistics

9.1 Corpus Linguistics Methodology

The research highlights the ongoing advancement of corpus linguistics methods as they adapt to theoretical progress and practical obstacles. Combining situational analysis with procedures focused on frequency-based identification exemplifies fruitful directions for theory-guided corpus studies.

The development of register-specific analytical frameworks suggests the need for more flexible and adaptive methodological approaches in specialized discourse analysis. This insight has implications for corpus linguistics research across professional and academic domains.

9.2 Register Studies Theory

The findings contribute to ongoing theoretical developments in register studies by providing empirical evidence for within-discipline variation and the primacy of communicative purpose in determining linguistic choices. These insights support more nuanced theoretical models that recognize multiple levels of register specificity.

The study's implications extend beyond medical discourse to suggest productive directions for register analysis in other professional domains where multiple specialized text types serve different communicative functions within shared disciplinary contexts.

9.3 Language Teaching and Assessment

The demonstration of register-specific linguistic features has broad implications for language teaching methodology, particularly in contexts emphasizing professional or academic communication skills. The study supports approaches that distinguish between general academic literacy and specialized professional competencies.

The identification of functional categories specific to professional practices provides insights relevant to needs analysis and curriculum design in language for specific purposes contexts.

10. Conclusion and Future Directions

Mbodj and Cortes's thorough exploration of variations in lexical bundles within medical discourse marks an important advancement in various fields of applied linguistics research. The study, which reveals considerable variation within a single discipline across two medical registers, questions traditional beliefs about linguistic uniformity within disciplines and offers detailed perspectives on how communicative intent influences language choices.

The methodological innovations in corpus construction, lexical bundle identification, and functional analysis establish new standards for specialized discourse investigation. The integration of frequency-based and contextual analytical approaches demonstrates productive directions for theory-driven corpus research.

The findings have practical applications across various professional fields, including medical education, professional growth, academic writing instruction, and publication support services. By systematically documenting linguistic features specific to particular registers, these findings offer tangible resources to enhance communication effectiveness in both medical and academic settings.

The theoretical insights enhance comprehension of register variation, formulaic language, and medical discourse, while also suggesting fruitful avenues for future study. Proving that communicative needs specific to a register create unique patterns of formulaic language use carries significant consequences for analyzing professional discourse in various fields.

As medical discussions progressively adapt to technological progress, shifts in professional practices, and the demands of global communication, the need for continuous linguistic research becomes more crucial. The analytical framework and new methodologies introduced in this study offer essential tools for meeting these evolving research requirements.

The study's focus on variation within a single discipline underscores the need to acknowledge linguistic diversity even

within seemingly uniform professional fields. This understanding carries significant implications for research in applied linguistics and advocates for ongoing exploration of specialized discourse practices in various professional and academic settings.

Upcoming studies that expand on this foundation might tackle restrictions in scope and representation and broaden the analytical framework to encompass new settings and communication methods. Advancements in register-sensitive approaches to discourse analysis are likely to offer a deeper insight into the role of language in catering to specific professional and academic communication needs.

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