

Constructing Academic Argumentation: The Role of Logical Connectives in Research Article Introductions

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Abstract:

This study aims to examine how logical connectives contribute to the construction of academic argumentation in research article introductions. It adopts a qualitative discourse-analytic approach supported by quantitative evidence, analyzing 15 research article introductions (13,221 words; 733 connectives). Connectives are classified based on their logical functions (ADD, CON, CAU, RES, SEQ, EXM) and mapped onto their argumentative functions (DEV, LIT, JUS, GAP). The findings indicate that additive connectives (ADD) are the most dominant, reflecting a tendency for writers to construct arguments through the accumulation and development of ideas, particularly in integrating previous studies. Contrastive connectives (CON) function not only to signal research gaps but also to establish the significance of the problem. Meanwhile, causal and resultative connectives contribute in strengthening the writer's argument justification. Furthermore, sequential connectives organize the progression of argumentation. These findings suggest that logical connectives function as rhetorical resources that link micro-level linguistic features to macro-level of argumentative structures in the introductory section of research articles.

Keywords: logical connectives; academic argumentation; research article introductions; discourse analysis; Systemic Functional Linguistics

Abstrak:

Penelitian ini bertujuan untuk mengkaji bagaimana penghubung logis berkontribusi terhadap pembentukan argumentasi akademik dalam bagian pendahuluan artikel ilmiah. Penelitian ini menggunakan pendekatan analisis wacana kualitatif yang didukung oleh bukti kuantitatif, dengan menganalisis 15 pendahuluan artikel ilmiah (13.221 kata; 733 penghubung). Penghubung diklasifikasikan berdasarkan fungsi logisnya (ADD, CON, CAU, RES, SEQ, EXM) dan dipetakan ke dalam fungsi argumentatifnya (DEV, LIT, JUS, GAP). Temuan menunjukkan bahwa penghubung aditif (ADD) merupakan yang paling dominan, yang mencerminkan kecenderungan penulis dalam membangun argumen melalui akumulasi dan pengembangan gagasan, khususnya dalam mengintegrasikan penelitian sebelumnya. Penghubung kontras (CON) tidak hanya berfungsi untuk menandai kesenjangan penelitian, tetapi juga untuk menegaskan signifikansi masalah. Sementara itu, penghubung kausal dan resultatif berkontribusi dalam memperkuat justifikasi argumentasi penulis. Selain itu, penghubung sekuensial mengorganisasi perkembangan alur argumentasi. Temuan ini menunjukkan bahwa penghubung logis berfungsi sebagai sumber daya retorik yang menghubungkan fitur linguistik pada tingkat mikro dengan struktur argumentatif pada tingkat makro dalam bagian pendahuluan artikel ilmiah.

Kata kunci: konektor logis; argumentasi akademik; pendahuluan artikel penelitian; analisis

wacana; Linguistik Fungsional Sistemik

INTRODUCTION

A research article is an argument written in scientific manner by following an academic writing style. Because it is an argument, the author must present claims, explain the significance, and also elaborate the reasons for the argument in order to convince readers of the importance of the research conducted. Therefore, a research article has a structured writing style to represent ideas in a systematic and logical way so that the argument can proceed coherently. To make the logical relations between sentences coherent, research papers usually require connectives to connect one element to another (Stojanovska-Ilievska, 2019).

Connectives are linguistic devices that link ideas within or across sentences to show logical relationships. Connectives can indicate relationships between sentences such as addition, contrast, cause, and also result that occur between clauses or sentences (Karlak & Šarić Šokčević, 2024). In academic discourse, this is very important for constructing arguments that are coherent and easy to understand. From a linguistic perspective, connectives have been introduced by M. A. K. Halliday through systemic functional linguistics. While their role in establishing coherence has been widely acknowledged, their function in shaping argumentation across specific sections of research articles remains an area that need closer investigation.

After recognizing the importance of connectives in academic discourse, it becomes interesting to investigate how connectives are used in the introduction section of journal articles. The introduction is an important part of a journal article because in this section, the author must provide strong reasons why the research is worth being conducted. It usually contains a description of the research area, a review of previous studies, a research gap, and eventually highlights the significance of the conducted research. Previous studies have been conducted to examine the function of metadiscourse in research article introductions (Cao & Hu, 2014; Livingstone, 2019), as well as the role of connectors in academic argumentation (Asassfeh et al., 2013). Although logical connectors have been widely studied as cohesive devices, their role in constructing persuasive academic argumentation, particularly in critical sections such as research article introductions, remains underexplored, especially in terms of the distinction of their internal metadiscursive functions.

Based on those studies, this research focuses on how connectives function as rhetorical resources

to construct academic argumentation, particularly in the introduction section of research articles. To achieve this objective, this study aims to answer the following research questions: (1) What types and functions of logical connectives are used in research article introductions?; (2) How do logical connectives contribute to the construction of academic argumentation in research article introductions?

THEORETICAL FRAMEWORK

Logical Relations and Connectives in Academic Discourse

Academic discourse is influenced by logical relations in the organization of ideas and the construction of coherent arguments (Pretorius, 2006). Logical connectives (LCs) are defined as words or phrases (such as moreover, therefore, however, consequently) that are used to indicate the direction of logical relationships among propositions within a text (Asassfeh et al., 2013). These devices are considered as cohesive markers that function to guide readers to understand how units of text are related to one another (Karahana, 2015). The appropriate use of connectives is considered very crucial for producing academic texts that are cohesive and coherent (Asassfeh et al., 2013).

Halliday and Hasan (1976) classify logical connectives into four main semantic categories: additive, adversative, causal, and temporal or sequential. These relations enable readers to follow the progression of ideas and interpret the writer's argument effectively by enabling readers to follow the progression of ideas more effectively and facilitating predictive processing during reading (Taylor et al., 2019). Within the framework of Systemic Functional Linguistics (SFL), logical relations form part of the textual resources that organize discourse into meaningful sequences (Cao & Hu, 2014). According to Halliday & Matthiessen (2014), language functions not only to represent experience (the ideational function) but also to structure information in ways that make texts coherent and interpretable (the textual function). In written discourse, logical relations are commonly realized through linguistic devices known as connectives, which explicitly signal how clauses and sentences are related to construct a unified meaning (Kalaitzopoulou et al., 2025).

Connectives as Interactive Metadiscourse

While Systemic Functional Linguistics explains logical relations as textual resources, metadiscourse theory further emphasizes their interactive role in guiding reader interpretation. Within the metadiscourse model, logical connectives are categorized as transitions, which

constitute a vital part of interactive resources (Hyland, 2005). Their primary function is not to add new propositional content, but rather to guide readers in navigating the text and to help them understand how different stages of the argument are related (Ekawati & Rosyidah, 2022). The use of these devices reflects the writer's awareness of the reader through what is referred to as recipient design, in which the writer assesses the extent to which readers require guidance, clarification, or explicit elaboration in order to follow the line of reasoning.

Connectives within this interactive category are classified based on the semantic relations they signal, which include the main functions that will be examined in this study. These functional categories are grounded in broader semantic classifications of logical relations (Biber et al., 1999; Halliday & Hasan, 1976) and have been operationalized in recent studies such as Alanazi's (2024). The categories are as follows:

- **Addition (ADD):** Used to add new elements to the argument or to extend existing points, such as *and*, *furthermore*, *moreover*, and *in addition*.
- **Contrast (CON):** Marks adversative relations that run counter to expectations or highlight differences between arguments, such as *but*, *however*, *in contrast*, and *on the other hand*.
- **Cause (CAU) & Result (RES):** These relations, often referred to as consequence or inferential transitions, indicate that a reason is being provided (CAU) or that a conclusion is being drawn (RES), such as *because*, *thus*, *therefore*, *consequently*, and *as a result*.
- **Sequence (SEQ):** Connects propositions chronologically or according to stages in the discourse, such as *first*, *then*, and *finally*.
- **Exemplification (EXM):** Functions to elaborate ideational meaning through examples in order to help readers grasp the writer's intention, often categorized under code glosses (Hyland, 2005), such as *for example* and *for instance*.

A crucial point in metadiscourse theory is the distinction between internal and external relations (Hyland, 2005). Connectives function as interactive metadiscourse only when they are internal, that is, when they organize the steps within the argument itself. For example, the word "*therefore*" is considered metadiscursive when it signals that the writer is drawing a conclusion from the preceding argument(s). In contrast, when it is used to explain cause–effect relations occurring in the real world (external), it is treated as part of the propositional content (Hyland, 2005). This

distinction reflects a shift in the research article writer's role from reporting research activities (research acts) to constructing arguments (writer acts) (Bunton, 1999, as cited in Hyland, 2005).

Academic Argumentation in Research Article Introductions

Research articles are essentially argumentative texts in which authors present claims, evaluate previous studies, and provide justification for the significance of their research. Among the various sections of a research article, the introduction plays a highly critical role in constructing the initial argument that frames the entire study. From a theoretical perspective, it is important to distinguish between argument as the claim, and argumentation as the active process of constructing that claim.

Academic argumentation in the introduction functions as the main gateway for introducing the topic and providing justification for the research problem addressed. This section serves a strategic purpose in establishing the research territory through the accumulation of literature, while simultaneously identifying theoretical or empirical gaps. The article authors employ argumentation to construct a "niche" for their research, in which the use of contrastive expressions becomes particularly crucial in emphasizing the problematization that characterizes research article introductions.

The rhetorical structure can be more clearly explained by using the Create A Research Space (CARS) model proposed by John Swales (1990). This model involves systematic rhetorical moves: establishing the research territory through the accumulation of literature (LIT), identifying a research gap (GAP), and presenting the current study as a form of justification (JUS). For this research, the researchers add one more rhetorical moves which is the argument development (DEV). DEV refers to the development and elaboration of arguments within the introduction, which is not explicitly captured in the CARS model but emerges as a necessary analytical category at the micro-discourse level. This category is informed by the notion of argument development in discourse, where propositions are progressively elaborated to construct a coherent line of reasoning (Hyland, 2005). The research article writers must organize their ideas logically in order to construct a persuasive development of argument (DEV). Therefore, logical connectives (such as ADD, CON, CAU, RES, EXM, and SEQ) play a vital role in signaling logical relationships among propositions and guiding readers through complex reasoning (such as LIT, GAP, JUS, DEV) in research article introductions.

METHOD

Research Design

This study employs a qualitative discourse analysis supported by quantitative data, following a methodological framework that combines in-depth textual analysis with frequency data to identify general trends in language use. The quantitative component involves calculating the frequency and distribution of logical connectives across the dataset to support the qualitative interpretation. Creswell (2009) emphasizes that the integration of qualitative and quantitative data can provide additional insight beyond what can be achieved by a single type of data, thereby enabling researchers to obtain a more complete and comprehensive understanding of the research problem. This analysis focuses on how connectives contribute to the construction of academic argumentation in the introduction section of research articles.

Data Source

The data consisted of 15 research article introductions selected from journals in the fields of linguistics and literature. Only the introduction sections were analyzed because this section plays a crucial role in establishing research area, reviewing previous studies, and constructing research gaps. Each introduction was treated as a unit of analysis in order to examine the distribution and function of logical connectives within the development of academic arguments.

Data Collection

The data were collected through the following procedures:

- Selecting research articles from linguistics or literature journals.
- Extracting the introduction section of each article.
- Identifying all logical connectives occurring in the texts.
- Highlighting and listing each connective found in the dataset.
- A total of 15 introduction sections were compiled as the research corpus.

Data Analysis

The analysis was conducted in three stages.

1. Identification and classification of connectives

All connectives appearing in the introduction sections were identified. After that, connective was categorized based on its logical function in the discourse. The functions were classified into several categories, including:

- addition
- contrast
- cause
- result
- exemplification
- sequence

2. Mapping to argumentative functions

Following the functional classification, each instance of connective use was further analyzed in relation to its role in the rhetorical structure of the introduction. Specifically, connectives were mapped onto four analytical categories: Development (DEV), Literature (LIT), Justification (JUS), and Gap (GAP). These categories were analytically derived from the rhetorical move structure proposed by John Swales (1990), with additional specification at the micro-discourse level.

3. Quantifying and interpreting the results

The results of this analysis were then quantified to identify frequency patterns and distribution across texts, and subsequently interpreted qualitatively to examine how logical connectives function as rhetorical resources in constructing academic argumentation.

FINDINGS AND DISCUSSION

The first research question addressed the quantitative distribution of logical connectives (LCs) in research article introductions, both at the overall level and different functional categories which consists of addition, contrast, cause, result, exemplification, and sequence. The findings also uncover the variety of LCs used in research article introduction. The corpus analyzed in this study consisted of 15 research article introductions, comprising a total of 13221 words. Within this corpus, a total of 733 LC tokens were identified. By dividing the total number of words by the number of LC tokens ($13221/733$), it resulting a ratio of 18,03 which indicates that one LC occurred approximately every 18 words. This finding reflects that LCs are used in relatively high frequency, especially in research article introductions. Related to how connectives are used to present argumentation, it can be interpreted that LCs play an important role in structuring the discourse of the article through the development of argumentation.

Table 1. Frequency of Logical Connectives

Measure	Value
Total number of texts	15
Total number of words	13.221
Total number of connectives (LCs)	733
Words per connective ratio	18,03
Average connectives per text	48,87
Highest density (per text)	82,6
Lowest density (per text)	45,3

Distribution of Connectives by Function

After finding out the linguistic, specifically the logical connectives distribution in table 1, this part of the paper presents how LCs are distributed based on their function in the texts. After careful examination, the distribution of LCs from its function shows that the most frequently used category was addition, with a total of 278 tokens. This result, which can be seen in table 2, corresponds to the occurrences of this category per introduction. This number is quite high compared to the use of other connectives. More than a third of the total number of connectives belong to addition. This predominance indicates that writers tend to rely heavily on additive relations to expand arguments and accumulate supporting information. Such a pattern is consistent with the rhetorical function of research article introductions, which require writers to build a research area by building the argument usually from general to more specific. In building these arguments by providing the phenomena, the research article writers provide their arguments by adding sentence per sentence. They might also add more information to their argument by connect them through the integration of previous studies.

The second most frequent category is contrast (CON) with 118 tokens. Compared to ADD, it has large gap, more than twice of its total number. The higher frequency of additive connectives (278) compared to contrastive connectives (118) can be considered a normal pattern in academic argumentation. This is because writers tend to develop and extend their arguments through additive relations, particularly in accumulating information and integrating previous studies. In contrast, contrastive relations are used more selectively to signal problematization, such as identifying gaps or highlighting limitations in prior research, rather than to support the continuous development of ideas.

The next three categories are cause (CAU) and sequence (SEQ), both of them have exactly 97

tokens. Then, it is followed by result (RES) with 79 tokens. The relatively high frequency of these categories indicates that writers actively organize their arguments not only by adding information but also by structuring logical reasoning and guiding readers through the progression of ideas. Causal and resultative connectives play a crucial role in establishing logical relationships between propositions, particularly in explaining reasons and drawing inferences. Their presence in introduction reflects the writers' effort to justify claims and strengthen the persuasiveness of their argumentation, especially in supporting the significance of the study. Meanwhile, sequential connectives (SEQ) contribute to the organization of discourse by signalling the order of ideas and stages of argument development. This function is particularly important in research article introductions, where writers need to guide readers through a structured presentation of background information, literature review, and the positioning of the current study. The less frequent categories include exemplification (EXM) with 64 tokens, suggesting that examples are used more selectively to support specific points rather than to structure the overall argument.

Table 2. Distribution of Logical Connectives by Functional Categories

Function	Frequency	Percentage (%)
Addition (ADD)	278	37.9%
Contrast (CON)	118	16.1%
Cause (CAU)	97	13.2%
Result (RES)	79	10.8%
Exemplification (EXM)	64	8.7%
Sequence (SEQ)	97	13.2%
Total	733	100%

Connectives and Argumentative Moves

From an argumentative perspective, the distribution of connectives corresponds closely with rhetorical moves in research article introductions. The high frequency of additive connectives (ADD) supports the development of argument (DEV), which appears as the most dominant function (366 instances). This indicates that writers primarily construct their argumentation through the accumulation and expansion of ideas. They gradually build a coherent reasoning which is expressed across the research introduction. Such a pattern reflects the tendency to provide continuity and elaboration, particularly in presenting background information and extending existing knowledge related to the phenomena.

The substantial presence of literature-related functions (LIT = 191) further reinforces this pattern,

suggesting that connectives play a central role in integrating previous studies into the argument structure. Through additive and related relations, writers are able to position their work within an existing research connection. From this process, the research writers try to establish credibility and significance to their study in the already developed knowledge ecosystem, especially in the respective field.

The contrastive connectives (CON) contribute to the identification of research gaps (GAP), which occur less frequently (63 instances). This relatively lower frequency suggests that, although writers always provide problematization in their introductions, it is not as extensively developed as the accumulation of supporting information. In other words, while gaps are present, they are often introduced selectively rather than being sustained as a dominant rhetorical strategy. However, contrastive relations in research article introductions do not exclusively function to signal research gaps. A substantial portion of contrastive usage is oriented toward constructing the significance of the research problem, by highlighting limitations or inconsistencies in prior studies. This indicates that contrast operates at multiple rhetorical levels, not only in establishing a gap (GAP), but also in reinforcing the importance of the research territory itself. This pattern is consistent with the rhetorical organization of introductions, in which explicit gap statements are typically concentrated in later stages, while earlier sections make use of contrast to build problem salience and justify the need for further investigation.

Causal (CAU) and resultative (RES) connectives play a crucial role in strengthening justification (JUS), which appears 132 times across the dataset. These connectives enable writers to establish inferential relationships, linking evidence to claims and demonstrating the necessity or significance of the current study. Their use reflects an effort to construct logical coherence and persuasive reasoning, ensuring that the argument is not only descriptive but also evaluative and goal-oriented.

These findings suggest an imbalanced yet systematic pattern of argumentation, in which development (DEV) and literature integration (LIT) dominate, while gap construction (GAP) is comparatively limited. This indicates that research article introductions tend to emphasize the expansion and contextualization of knowledge more than critical differentiation, with justification (JUS) functioning as a bridging mechanism that connects accumulated information to the rationale of the study.

Table 3. Distribution of Argumentative Functions in Research Article Introductions

Function	Frequency
Development (DEV)	366
Literature (LIT)	191
Justification (JUS)	132
Gap (GAP)	63

The Role of Logical Connectives in Constructing Academic Argumentation

The distribution that has been presented in the findings shows how logical connectives contribute to the construction of academic argumentation in research article introductions. However, the pattern might not clear yet in the previous section. Logical connectives not only functioning merely as cohesive devices, connectives operate as rhetorical resources that organize reasoning, guide interpretation, and shape the development of arguments.

Additive connectives (ADD), as the most dominant category, contribute to argumentation by enabling the accumulation and expansion of ideas. Through these relations, writers progressively build their arguments, integrating background information and previous studies to establish a coherent research territory. This function is closely associated with the development of argument (DEV) and the incorporation of literature (LIT), reflecting a tendency to construct argumentation through elaboration and continuity.

Data 1

"...research article is a widely researched area for English for academic purposes (EAP) **and** it continues to be the 'pre-eminent genre...'... **This is due to the fact that...**"

The connective and functions as an additive (ADD) relation in this context, serving to extend the proposition by introducing additional information. Meanwhile, the expression "this is due to the fact that" functions as a causal (CAU) relation, establishing a logical link between the preceding statement and its underlying reason. From an argumentative perspective, the additive connective contributes to the gradual development of the argument (DEV) by expanding and elaborating the initial claim. In contrast, the causal connective supports the reasoning process by explaining why the claim holds, thereby strengthening the logical coherence of the argument.

Contrastive connectives (CON), although less frequent, play a critical role in pointing the problematization. They contribute to argumentation by highlighting inconsistencies or

limitations in previous research, thus facilitating the identification of research gaps (GAP). However, their function is not limited to gap construction. Contrast is also used to enhance the salience of the research problem, reinforcing the significance of the study even when an explicit gap is not directly stated.

Data 2

*"... **While** a substantial body of research has explored..., **there remains** a need for a more nuanced examination..."*

The use of "while" signals a contrastive relation, while "there remains" introduces an unresolved issue within the existing literature. Together, these expressions highlight limitations or insufficiencies in previous studies. Rather than directly stating a research gap, they function to construct a research problem by emphasizing areas that require further investigation. From an argumentative perspective, this contrastive structure contributes to problematization by foregrounding the tension between what has been established and what remains insufficiently addressed. At the same time, it reinforces the significance of the study, as the identified limitation implicitly justifies the need for further research.

Causal (CAU) and resultative (RES) connectives contribute to argumentation by establishing inferential relationships between propositions. These connectives enable writers to link evidence to claims, articulate reasoning, and justify the necessity of the study. Their role is more clearly seen in the realization of justification (JUS), where logical connections are used to demonstrate why the research is needed and how it responds to existing issues in the field.

Data 3

"This is **due to the fact** that nowadays universities worldwide require researchers to publish..."

The expression "due to the fact that" functions as a causal connective, signaling a cause–effect relationship by providing a reason for the preceding claim. This causal relation serves to explain underlying conditions that justify the statement being made. From an argumentative perspective, the use of this connective strengthens the argument by linking claims to their supporting reasons, thereby enhancing logical coherence. It also contributes to the justification (JUS) of the study, as the explanation provided reinforces the importance and relevance of the research within its broader academic context.

Sequential connectives (SEQ), on the other hand, contribute to the organization of argumentation by structuring the progression of ideas. They guide readers through the stages of discourse, ensuring that the development of argument remains clear and accessible. This organizational function supports the overall coherence of the introduction, allowing readers to follow the logical flow of reasoning from background information to research positioning.

"...first, the literature review provides... Then, objectives and research methods are explained. Finally..."

The connectives "first," "then," and "finally" function as sequential markers (SEQ), indicating the ordered progression of ideas within the discourse. These markers organize the structure of the text by signaling the sequence of rhetorical stages presented in the introduction. Their primary function is to guide the reader through the logical flow of information, ensuring that each stage of the argument is presented in a clear and systematic manner. From an argumentative perspective, these sequential connectives contribute to the organization of argumentation by structuring the development of ideas and facilitating reader comprehension.

CONCLUSION

This study aims to examine how logical connectives contribute to the construction of academic argumentation in research article introductions. The findings reveal that logical connectives are not merely cohesive devices, but function as essential rhetorical resources that shape the development, organization, and interpretation of arguments. From the quantitative analysis, it shows that additive connectives (ADD) are the most dominant, indicating that writers primarily construct their arguments through the accumulation and expansion of ideas. This pattern is closely associated with the importance of argument development (DEV) and literature integration (LIT) to the introduction. On the contrary, contrastive connectives (CON), although less frequent, play a critical role in problematization. However, their function extends beyond the explicit identification of research gaps (GAP), as they are also used to construct the significance of the research problem by highlighting tensions and limitations in prior studies. This indicates that contrast operates across multiple rhetorical stages rather than being confined solely to gap construction. Furthermore, causal (CAU) and resultative (RES) connectives contribute to the justification (JUS) of the study by establishing inferential relationships between claims and supporting reasons. Sequential connectives (SEQ), on the other hand, organize the progression of

ideas and guide readers through the structure of the argument, ensuring coherence and clarity.

From a theoretical perspective, this study contributes to the existing literature by extending the understanding of logical connectives toward their role as rhetorical and metadiscursive resources, especially functional mapping between connective use and argumentative functions (DEV, LIT, JUS, and GAP), thereby linking micro-level linguistic features with macro-level argumentative organization. From a practical perspective, the findings offer implications for academic writing pedagogy, particularly in article journal writings. It suggests the need to raise learners' awareness of the strategic use of connectives, especially contrastive relations, in constructing more critically balanced and persuasive arguments. Future research may explore how these patterns vary across disciplines or proficiency levels, as well as how the use of connectives relates to the overall quality of academic writing.

REFERENCES

- Alanazi, Z. (2024). An Exploratory Analysis of Linking Adverbials in Research Articles Across Different Disciplines. *Theory and Practice in Language Studies*, 14(4), 1181–1192. <https://doi.org/10.17507/tppls.1404.26>
- Asassfeh, S. M., Alshaboul, Y. M., & Alshaboul, S. M. (2013). Distribution and Appropriateness of Use of Logical Connectors in the Academic Writing of Jordanian English-Major Undergraduates. *Journal of Educational & Psychological Sciences*, 14(03), 559–583. <https://doi.org/10.12785/jeps/140320>
- Biber, D., Johansson, S., Leech, G., Conrad, S., & Finegan, E. (1999). *Longman grammar of spoken and written English*.
- Cao, F., & Hu, G. (2014). Interactive metadiscourse in research articles: A comparative study of paradigmatic and disciplinary influences. *Journal of Pragmatics*, 66, 15–31. <https://doi.org/10.1016/j.pragma.2014.02.007>
- Ekawati, R., & Rosyidah, A. Al. (2022). Metadiscourse markers in English essays written by Indonesian students in EFL setting. *ELTIN JOURNAL: Journal of English Language Teaching in Indonesia*, 10(2), 127–138.
- Halliday, M. A. K., & Hasan, R. (1976). *Cohesion in English*.
- Halliday, M. A. K., & Matthiessen, C. M. I. M. (2014). Edition Introduction To Halliday ' S Introduction To Functional. In *USA and Canada by Routledge 711 Third Avenue, New York, NY 10017*.
- Hyland, K. (2005). *Metadiscourse: Exploring Interaction in Writing*.
- Kalaitzopoulou, E., Christopoulos, A., & Siolios, K. (2025). The Use and Appropriateness of Connectives in Academic Writing. *The IAFOR International Conference on Education – Hawaii 2025 Official Conference Proceedings*, 385–411. <https://doi.org/10.22492/issn.2189-1036.2025.33>
- Karahan, P. (2015). A Diagnostic Analysis of ELT Students' Use of Connectives. *Procedia - Social and Behavioral Sciences*, 199(1983), 325–333. <https://doi.org/10.1016/j.sbspro.2015.07.555>
- Karlak, M., & Šarić Šokčević, I. (2024). Additive and Causal Connectives in GFL Argumentative

- Writing. In *Jezikoslovje* (Vol. 25, Issue 1, pp. 97–116). <https://doi.org/10.29162/jez.2024.3>
- Livingstone, K. A. (2019). Examining the Use of Metadiscourse Markers in Academic Writing. *International Journal of Literature, Language and Linguistics*, 5(3)(3), 244–254. www.premierpublishers.org.
- Pretorius, E. J. (2006). The comprehension of logical relations in expository texts by students who study through the medium of ESL. *System*, 34(3), 432–450. <https://doi.org/10.1016/j.system.2006.02.003>
- Stojanovska-Ilievska, N. (2019). *THE USE OF LOGICAL CONNECTORS IN THE ACADEMIC WRITING OF MACEDONIAN LEARNERS OF ENGLISH*. <https://consensus.app/papers/the-use-of-logical-connectors-in-the-academic-writing-of-stojanovska-ilievska/be601fd90b3c5f6fba4b3e07152519f7/>
- Swales, J. (1990). *Create a Research Space (CARS) Model of Research Introductions*. 1–3.
- Taylor, K. S., Lawrence, J. F., Connor, C. M., & Snow, C. E. (2019). Cognitive and linguistic features of adolescent argumentative writing: Do connectives signal more complex reasoning? *Reading and Writing*, 32(4), 983–1007. <https://doi.org/10.1007/s11145-018-9898-6>