

Stance and Cohesion: The Use of *However* and *While* in AI-Human Argumentative Discourse

Yu-Che Yen

Department of English

National Chengchi University

yantwstudy@gmail.com

Siaw-Fong Chung

Department of English

National Chengchi University

sfchung@nccu.edu.tw

Abstract

This study investigates how connectives *However* and *While*, signaling contrast/concession to construct stances, are distributed by AI chatbots in task-based argumentations. The corpus, comprising 13,482 words of chatbot-produced discourse, was analyzed to examine the connectives' sentence positions and their relation to content-, writer-, and reader-oriented propositions, based on an integrated framework of Hyland's (2005) framework and Thetela's (1997) evaluative-entity framework. A total of 124 tokens of *However* and *While* were extracted, excluding tokens whose stance and cohesive functions can't be clearly interpreted. Results show sentence-initial *However* (N=40) and sentence-initial *while* (N=59) are the primary devices for asserting a writer-oriented stance, signaling evaluation, claim or counter-claim. Sentence-initial *while* are more frequently used to frame a factual premise before projecting writer orientation. As to sentence-medial *while*, both preceding and subsequent clauses are often presented content-oriented propositions, indicating achieving cohesion is prioritized over expressing an evaluative stance. This study concludes that the use of these connectives, strategically applied in AI-human argumentations, shows how connectives contribute to manage stance construction and discourse coherence.

Keywords: Stance, Cohesion, AI, Argumentative, Persuasion

1. Introduction

Conjunctions, according to Fraser (1999), refer to its interchangeability as "discourse markers, discourse connectives, discourse operators, pragmatic connectives, sentence connectives, and cue phrases (p. 931), are used to establish cohesive relations within a context. Fraser asserts that these cohesive units are used to segment discourses as S1 and S2 to signal the relationship between propositions. Rehbein (2019) further emphasizes the importance of using specific form of connectives (concessive and contrastive ones) in either informal/ formal or spoken/ written discourse can present pragmatic strategies in making arguments more convincing and

persuasive. Kamalski et al. (2006) found that in argumentative and persuasive discourse, explicit coherence marking provides not only clarities but also positive evaluations for interlocutors (also see Felder, 2015; Stab and Gurevych, 2014; Eckle-Kohler et al., 2015). Eckle-Kohler et al. (2015) found that discourse connectives are featured in signaling a prediction between premise and claim in argumentative context. The evidence from these empirical studies show that discourse connectives are used to make cohesion strategically. Also, Maamujav (2025) found that rhetorical features of discourse connectives strongly help make predictions in argumentative context.

Among all these discourse connectives, the adversative relation plays a particular prominent role in sharing the argumentation. Halliday and Hasan (1976) assert that adversative connectives signal a proposition that is "contrary to expectation" (p. 252). Similar assertions can be found in Rehbein (2019). Rehbein found that discourse connectives (e.g., though, while, thus, however) often used in written articles. The discourse connective *however*, classified by Halliday and Hasan (1976) as an emphatic adversative form and described by Schiffri (1987) as a contrastive marker, signals a semantic relationship of contrast that enables a writer or speaker to return to a previous concern or to preface a defense against an opposing view. By indicating contrast (*but*, *however*), addition (*moreover*), causation (*thus*), etc., writers manage the reader's comprehension along the argumentative path. A speaker or a writer can deploy pragmatic strategies in framing arguments with using these adversative/ contrastive connectives. Despite the established importance of these rhetorical devices, the systematic variation in how specific discourse relations, particularly adversative markers used to express argumentative stances, are deployed for persuasion strategies across different, controlled communication settings remains an area actively awaiting deeper empirical investigation. While

studies have established that the use of connective forms (e.g., *however* vs. *but*) is genre-specific, this study aims to explore whether variations at the level of the semantic discourse relation reflect different persuasive strategies.

2. Literature Review

2.1 Significance of Connectives for Coherence and Interaction

Halliday and Hasan's (1976) seminal work on cohesion classifies conjunction (connectives) as a key cohesive relation that specifies "the way in which what is to follow is systematically connected to what has gone before" (p. 227). In other words, connectives explicitly link propositions so that a text links together logically. Schiffrin (1987) likewise noted that discourse markers "have a role in accomplishing the integration needed for discourse coherence" by helping readers navigate transitions between ideas (p. 29). Beyond creating cohesion, connectives serve an interactive, reader-guiding function. They signal the intended relationship between statements and serve to cue readers how to interpret new information. For example, Fraser (1999) defined discourse markers as lexical expressions (often conjunctions or adverbs) that "signal a relationship between the interpretation of the segment they introduce, S2, and the prior segment, S1" (p. 950). For example, Fraser stated that discourse markers (e.g., *However*, *Furthermore*, *Thus*, *Incidentally*) mark segmentations either in canonical case or joined by a subordinate clause. Hyland's (2005) framework underscores this interactive role of connectives in writer reader engagement. The framework classifies logical connectives (also treated as transitions) as interactive resources that organize discourse for the reader's benefit. Such transitions "help readers interpret pragmatic connections between steps in an argument, signaling additive, causative, or contrastive relations in the writer's thinking" (Hyland, 2005, p. 59). In sum, connectives function as signposts that not only bind text together cohesively but also guide readers through the argument, which reflects the writer's effort to manage and even influence the audience. This guiding/interactional function is especially crucial in persuasive contexts, where the effective use of connectives can clarify argumentative structure and subtly involve readers in the development of the discourse.

2.2 Contrastive Connectives and Stance in Persuasive Writing

Empirical research on persuasive discourse has emphasized the crucial role of contrastive connectives in structuring arguments and guiding reader interpretation. In a corpus study of persuasive texts, Rehbein (2019) demonstrated that even when author and topic are held constant, the frequency of specific contrastive markers varied remarkably with communicative context. For instance, connectives such as *however* and *while* were found to be far more typical of written, monologic articles, whereas a marker like *but* (along with causal connectives like *because* and *so*) dominated in dialogic interview settings. This distributional shift suggests that writers strategically adapt connective usage to fit audience expectations and medium constraints. Indeed, discourse connectives have been identified as strategic devices for persuasion: certain connectors reliably signal argumentative moves and even improve a text's reception. A recent large-scale study by Maamujav (2025) on student essays found that higher-rated persuasive writing is characterized by adept use of rhetorical features such as logical connectives and cohesive structuring. The discourse connective, *thus*, for example, provides the cohesive structuring necessary to link the premise (S1) and the ensuing conclusion/research rationale (S2) into a single, interconnected semantic unit. It explicitly manages the argumentative path by cueing the reader that they are about to receive an inference based on the preceding information. In Maamujav's study, a latent factor representing rhetorical cohesion significantly predicted holistic writing quality. These findings collectively shown that contrastive connectives (e.g. *however*, *although*, *while*, *but*) are not mere add-ons to argumentative texts but crucial to how writers articulate their stance and achieve persuasion.

Despite these empirical progresses, there are clear limitations of these studies (such as Maamujav, 2025; Rehbein, 2019, Thetela, 1997) with regard to connective usage and writer stance. A notable gap is that many studies (such as Fraser, 1999; Rehbein, 2019) treat all contrastive connectives as functionally interchangeable signals of contrast or concession without examining how individual connectives might convey subtle evaluative stances. In broad

quantitative analyses (such as Maamujav, 2025), connectives are often tied together as a single cohesive device category. This implicitly assumes that choosing *however* versus *while* makes little difference so long as a contrast is signaled. Rehbein's (2019) study noted, discourse connectives are highly ambiguous and polyfunctional, being capable of expressing multiple types or flavors of relations. For instance, *however*, most commonly employed as a sentence-initial conjunctive adverb, typically signals a more forceful adversative stance by explicitly marking a shift to the writer's counter-argument. For example, in Fraser's (1999) study, the example "*Harry is old enough to drink. However, he can't because he has hepatitis.*" (p.938) showed that the connective *However*, acting as a cohesive tie connecting the message of S2 (the counter-argument) to S1 (the premise), introduces a counter-argument or correction, which is supported by its nature as a discourse marker and its structural independence. By contrast, *while*, when functioning as a subordinating conjunction in concessive use, often introduces a clause that mitigates the opposition and relegates the contrasting view to a backgrounded or less prominent position. For example, in Rehbein' (2019) study, the example "*Mary likes to read while John loves cooking.*" (p. 148) showed that the proposition violated the expectation, leading to an asymmetric connection. In other words, *however* overtly signals a rebuttal or correction, sharply delineating the writer's position against a preceding point, while a connective like *while* can mitigate opposition by weaving the contrast into the same sentence, thereby softening the presentation of an alternative view. Such differences suggest that connective choice can subtly influence the tone of disagreement and the writer's evaluative stance toward content.

Yet, current literature in argumentation and writing analytics rarely accounts for these nuances. Most frameworks focus on if a contrastive link is present rather than how it is realized. As research to date has convincingly shown that contrastive connectives are key contributors to cohesion and argument structure, there is a need to move beyond treating *However*, and *While*, with similar meanings, as interchangeable linguistic items. Therefore, this study explores how *However* and *While* are used to maintain coherence and make stances.

3. Methodology

3.1 Data Collection

This pilot study explored how AI chatbots utilize the contrastive connectives *however* and *while* in persuasive debate contexts. The research was set within a computer-mediated discourse environment. Task-oriented chatbots play the role of interlocutors. The purpose of this design was twofold: (1) to provide learners with a controlled but interactive context to engage in persuasive dialogue, and (2) to generate a learner corpus for the systematic analysis of connective use in argumentative discourse.

3.1.1 Participants

Six graduate students participated in the study. Their English proficiency was verified at the CEFR B2 level or higher, which met the departmental requirement for admission. All participants were enrolled at universities in Taiwan. They had no prior experience in formal debate but demonstrated adequate linguistic competence to engage in argumentative tasks. Each participant provided informed consent, and the study was conducted in accordance with ethical research standards.

3.1.2 Chatbot Design

Data were collected using EduACT, a chatbot platform developed by the Department of Computer Science and Information Engineering at National Central University. The platform enables the design of task-oriented conversational agents by specifying agent information, learning topics, task modules, and agent action strategies. Four debate chatbots were created, and that each chatbot were programmed to conduct structured argumentative discussions on the following topics: (a) Should a zoo be built? (b) Should the voting age in Taiwan be set at 18? (c) Should the duration of university semesters be reduced to 16 weeks? (d) Others. Each chatbot was programmed with modular discourse components, including greetings, topic initiation, stance elicitation, argument exchange, rebuttal, wrap-up, and closing. The chatbot language, set to CEFR B1–B2 to ensure comprehensibility for the participants, aimed to make sure participants will focus on employing debate strategies without having a hard time in linguistic choices.

3.1.3 Procedures and Data Collection

Participants were instructed to engage in a debate session with the chatbot for at least 30 minutes. They were informed the topic of choices during the instructions and later decided which debate topic they were going to argue with the chatbot. Also, they were asked to maintain a persuasive stance and respond to the chatbot's prompts, counterarguments, and rebuttals. The chatbot encouraged elaboration and reasoning but provided only limited feedback to ensure the learner's responsibility for sustaining argumentation. All interactions were conducted in English and recorded accordingly by the EduACT platform. The transcripts generated through the task were established as the learner corpus. The dataset comprised a total of 13,482 words of chatbot-generated discourse produced in AI-human debate sessions. This corpus size provides a sufficient basis for examining the syntactic and functional distribution of contrastive connectives as well as their co-occurrence with stance markers and modal verbs. This corpus provides consistent interactional scaffolding while capturing authentic learner responses to argumentative stimuli.

3.2 Data Analysis

The analysis proceeded in several stages. First, all transcripts were cleaned and anonymized in the Excel file and we further examined the frequency and distribution of these connectives to identify their preferred syntactic positions and discourse environments in the AI-generated argumentations. Each occurrence of *While*, and *However* was analyzed within its immediate clause structure to determine the relationship between the preceding clause (X) and the subsequent clause (Y). The term preceding clause refers to the proposition or sentence that appears before the connective, whereas the subsequent clause denotes the proposition or sentence that appears after it. The identification of X and Y was based on syntactic and punctuation cues (e.g., commas, periods) as well as the logical boundaries of meaning within each sentence. In this study, three sentence patterns were analyzed: (1) *While* X, Y, (2) X *while* Y (3) X. *However*, Y.

To provide a coherent analysis of identifying how these connectives contribute to the construction of argumentative stance, this study integrated Hyland's (2005) stance framework with Thetela's (1997) model of evaluative

entities. Thetela's model provides the evaluative base whereas Hyland's framework adds strategies. This integration allows each clause or connective-linked proposition to be examined. In this study, content-orientation refers to propositions where connectives link factual or topic-related evaluations that aim to represent external reality with precision rather than negotiate interpersonal meaning. In example (A), *While* connects two factual statements which describe contrasting conditions. The connective links topic-related evaluations of the impact of the economic growth without showing the writer's attitude or reader engagement. Therefore, the proposition is content-oriented and it emphasizes the contrast in reality rather than interpersonal meaning. Writer-orientation denotes propositions where connectives accompany research-oriented evaluations that hedge or distance the writer's personal commitment to claims. In example (B), *however* introduces a qualification that hedges the writer's commitment to the prior claim. The connective signals a shift from assertion to caution with using the modal verb *can* to reflect the writer's assertion of the necessity of further testing. Reader-orientation, by contrast, occurs when connectives introduce evaluations that engage the interlocutor. In example (C), the second proposition introduced by *while* includes the phrase "*we should remember*", which explicitly invites the reader to participate in the reasoning process, even though in this case the writer uses the modal verb *should*. This usage shows that the writer is acknowledging the reader's role as an active interpreter in the discourse. These criteria provide a systematic approach to categorize stance orientation across propositions.

- (A) *While economic growth benefits urban populations, rural communities often experience slower development.*
- (B) *The results appear promising; however, further testing is required before firm conclusions can be drawn.*
- (C) *The findings appear encouraging, while we should remember that these outcomes may vary across contexts.*

The data analyzed consist solely of AI-generated texts produced during task-based argumentative interactions with human interlocutors. By isolating the AI's discourse, the analysis can more precisely capture how the system itself constructs cohesion and negotiates

stance when responding to argumentative prompts to better facilitate students in enhancing their argumentation skills. The following chapter details the distributional patterns of each connective and discusses their rhetorical functions across the corpus.

4. Results and Discussion

This chapter presents the findings of this study by investigating how the contrastive connectives *however* and *while* were used in AI-human argumentative discourse and this study looked at the AI language use. The discussion focuses on the frequency, distribution, and discourse functions of these two connectives to reveal how they contribute to both cohesion and stance construction in argumentation. The following sections present the quantitative distribution of each connective and discuss how the pattern reflect the AI's cohesive strategies and stance-taking behaviors across argumentative tasks.

4.1 Distributions of Contrastive Connectives

Connective Type	Raw Frequency	Valid Tokens
<i>However</i>	45	40
<i>While</i> (sentence-initial)	68	59
<i>while</i> (sentence-medial)	24	25
Total	137	124

Table 1: Distribution of *while/While* and *However* in the Corpus.

In Table 1, a total of 137 connective tokens were identified through a corpus-based search for the lexical items *however* and *while* across the AI-generated argumentative texts. Each token was manually verified and categorized by its orthographic form (capitalized or lowercase) and sentence position (sentence-initial or sentence-medial). Capitalized forms (e.g., *However*, *While*) were classified as sentence-initial connectives functioning at the discourse level, whereas lowercase forms (e.g., *however*, *while*) were generally categorized as sentence-medial connectives operating within clauses. However, lowercase instances of *while* that followed

introductory adverbials such as *Secondly* were also coded as sentence-initial, since they introduced the first clause of the sentence and served to link the current proposition to the preceding argumentative context. No sentence-medial occurrences of *however* were found in the corpus, indicating that the connective was used exclusively in sentence-initial position by the AI system. This consistent capitalization pattern suggests that *however* primarily functioned as a discourse-level contrastive marker, rather than as a clause-internal adverb, in AI-generated argumentation.

After a detailed manual examination, 124 tokens were retained for analysis. Thirteen tokens were excluded because the surrounding discourse provided insufficient contextual evidence to determine their stance orientation—specifically, whether the connected clauses were content-oriented, writer-oriented, or reader-oriented according to Hyland's (2005) framework and Thetela's (1997) model of evaluative entities. Consequently, the final dataset included only those tokens whose stance and cohesive functions could be clearly interpreted within argumentative contexts.

As shown in Table 1, *While* appeared most frequently, accounting for nearly half of all tokens in the corpus, followed by *however* and sentence-medial *while*. The absence of sentence-medial *however* confirms that the AI consistently employed the connective as a sentence-level transition marker, which signals contrast between major argumentative propositions. The relatively high frequency of *While* suggests that the AI often initiated argumentative turns with concessive or contrastive framing. In other words, *While* is used it to structure opposing or qualifying claims.

4.2 Distributional Patterns and Stance Orientation

This section presents the detailed distribution of the 124 valid connective instances and examines how *however* and *while* operate within different stance orientations. The classification followed Hyland's (2005) framework and Thetela's (1997) model of evaluative entities, which functions within a content-oriented (CO) context (factual or topic-related evaluations), writer-oriented (WO) context (reflecting authorial stance), or reader-oriented (RO) context (inviting reader engagement). This analysis allows for a more nuanced interpretation of how the AI constructs

logical relations and expresses evaluative positioning through contrastive connectives in argumentative interactions.

The distributional analysis first focused on the preceding and subsequent clauses linked by each connective, revealing how these relations contribute to local cohesion and stance realization. Quantitative results were then interpreted in light of the connective's rhetorical role in order to show how AI-generated argumentation builds coherence and authority. Table 2 summarizes the combined distribution of *however* and *while* across stance categories in both clause positions.

Connective Type	Preceding Clause			Subsequent Clause		
	CO	RO	WO	CO	RO	WO
<i>However</i>	25	10	5	1	2	37
<i>While</i> (sentence-initial)	56	0	3	1	0	58
<i>while</i> (sentence-medial)	12	0	13	22	1	2
Total	93	10	21	24	3	97

Table 2: Combined Distribution of *while/While* and *However* by Orientation in Preceding and Following Clauses (N = 124).

4.2.1 Functional tendencies in the preceding clause

In the preceding clause (X), the connectives primarily serve content-organizing purposes, which links propositions through logical, contrastive, or concessive relations that construct the interactive arguments. Among the connectives, *While* (capitalized) frequently introduces a contextual or contrastive/concession discourse against which the subsequent clause develops the main stance.

(1) CO: ... While visiting companies can offer firsthand exposure, it is important to note that classroom education provides a foundation of knowledge,...

In the excerpt (1), the preceding clause "While visiting companies can offer firsthand exposure" "

presents a contextual concession that acknowledges the potential benefits of an opposing view before the AI continues its main argument in the following clause. The connective *While* here introduces a background condition that appears to align with the opponent's reasoning but immediately contrasts it with a stronger counter-assertion, which is "classroom education provides a foundation of knowledge." This structural move reflects the concessive/adversative function of *While* as defined by Halliday and Hasan (1976), where the initial clause serves to moderate or anticipate disagreement while preserving logical continuity. Functionally, this use of *While* demonstrates how the AI organizes argumentative discourse by balancing acknowledgment and rebuttal and further creates a smooth transition between opposing propositions without disrupting overall cohesion.

Similarly, *However* appearing in preceding clauses frequently introduces a counter-claim or an alternative perspective that contrasts with the immediately preceding proposition.

(2) CO: ... that they play a crucial role in conservation efforts by protecting endangered species and educating the public about wildlife conservation. However, critics argue that these goals can be achieved through alternative means such as wildlife sanctuaries or nature reserves without...

In excerpt (2), *However* marks a discourse shift from an affirmative stance to an opposing viewpoint, guiding readers through a transition between conflicting propositions. The connective operates primarily as a content-oriented meta-discourse marker, organizing propositional relations rather than conveying personal evaluation. According to Hyland's (2005) framework, such usage indicates that the AI's focus remains on maintaining logical and cohesive contrast, emphasizing informational balance rather than interpersonal engagement. Through this function, *However* intensifies the structural integrity of the argument while delineating competing claims within the same topical frame.

(3) CO: ... lowering the voting age can provide young people with an opportunity for political participation from an earlier stage of life while

also fostering civic engagement among youth. In conclusion: Lowering the voting age allows young people aged 18 or above who...

By contrast, the sentence-medial *while* often operates within the sentence to connect simultaneous or concessive conditions. In excerpt (3), *while* functions as an intrasentential connector, linking two clauses that share thematic continuity and occur in parallel. The connective signals syntactic subordination, which emphasizes propositional linkage rather than a shift in stance. This corresponds to Blühdorn's (2008) description of subordination in syntax and discourse, where *while* does not introduce a new argument but rather integrates a supporting or co-occurring condition within the same argumentative frame. Thus, the clause preceding *while* contributes to the content-oriented organization of ideas, maintaining cohesion through logical simultaneity instead of contrastive opposition.

A smaller portion of preceding clauses (ten cases) involved *However* functioning as an attentional cue that directs the reader's focus and signals a forthcoming shift in reasoning. According to Hyland's (2005) framework, such use represents a reader-orientation. The connective helps readers follow the logical flow of argumentation rather than expressing the writer's personal attitude.

(4) RO: ...*I believe your concern, XXX. Learning a foreign language does require more time and practice compared to other subjects. However, I believe that reducing the total number of weeks in the university to 16 can still be beneficial for language...*

In excerpt (4), *However* performs a reader-guiding function, which helps the reader to anticipate a contrastive move while maintaining textual coherence. This function reflects discourse management, that is, language is used to structure understanding and facilitate reader processing. This shows that the AI's connective use prioritizes textual clarity and reader comprehension over interpersonal engagement.

Meanwhile, writer-oriented preceding clauses (21 instances) exhibit explicit stance marking. It is often realized through evaluative or modal expressions embedded within *while*-clauses. These linguistic elements project judgment,

intention, or obligation, thereby signaling the writer's evaluative control over the discourse rather than neutral description.

(5) WO: ...*This way, students can engage in meaningful discussions while also gaining practical experience outside the classroom. ...*

In excerpt (5), the modal "can" expresses possibility and positive potential, which frames the action as both attainable and desirable. The evaluative adjective "meaningful" further marks the writer's approval to project value judgment within the subordinate *while*-clause. These linguistic cues position the AI as asserting that experiential learning is beneficial, thereby intensifying an affirmative stance.

(6) WO: ...*we ensure that these benefits are maximized while minimizing any negative impacts on animal welfare or environmental concerns...*

Similarly, in excerpt (6), the verbs "ensure" and "maximize" convey intentionality and moral evaluation; while the present participle "promoting" embodies an evaluative implication of social good. Across these examples, the embedded *while*-clauses function as stance-bearing extensions instead of neutral elaborations. This confirms Hyland's (2005) view that stance is often realized lexically and grammatically through evaluative or modalized language, which in turn aligns with Thetela's (1997) model of writer-oriented evaluation. That is, authors project their beliefs and commitments explicitly in text.

In sum, *While* and *However* in the preceding position primarily function as textual cohesive devices, which organizes propositional flow and marks transitions between argumentative turns. Their roles are largely structural rather than interpersonal. It supports the logical development of ideas and signals shifts in argumentative direction rather than projecting the writer's personal stance. Through these connectives, the AI manages discourse coherence and establishes clear rhetorical boundaries across turns, and further maintains smooth progression within the argumentative sequence.

4.2.2 Functional tendencies in the subsequent clause

While the preceding clauses primarily serve to organize propositional content and establish logical transitions, the subsequent clauses (Y) reveal how the AI develops stance and evaluation in response to the ideas introduced earlier. Table 2 shows the dominance of *writer-oriented* functions (97/124, 78.2%) across the connectives. In this proposition, connectives often signal a shift from exposition to evaluation, which transforms informational content into an explicit argumentative stance. The subsequent clause thus becomes the site where writer-oriented expression emerges most strongly, which is frequently realized through evaluative lexis, modal verbs, or contrastive assertions that consolidate the AI's position. By examining these tendencies, this section demonstrates how the AI constructs cohesion while simultaneously intensifying its argumentation within the discourse sequence.

However overwhelmingly performs this evaluative function, with 37 of its 40 subsequent clauses to express the writer's viewpoint, qualification, or interpretive stance.

(7) WO: ...*It is indeed a valuable experience that can provide them with a different perspective on the industry or specific companies. However, I would like to propose that classroom education and real-world experiences are not mutually exclusive but rather complementary...*

In excerpt (7), the connective *However* marks a clear shift from factual description to interpretive evaluation. The preceding clause presents a neutral, content-oriented observation, while the subsequent clause, introduced by *However*, reframes the discussion through a writer-oriented assertion, "...I would like to propose...". This illustrates how *however* shifts from a cohesive organizer to a stance-marking device. It allows the AI to project argumentative authority and evaluation in the argumentation. The connective thus performs a dual role, which is to maintain logical contrast while simultaneously emphasizes authorial judgment. This rhetorical function aligns with Hyland's (2005) notion of stance as authorial presence, in which meta-discourse markers mediate the writer's epistemic and attitudinal positioning.

Similarly, *While* (capitalized) frequently introduces a subordinate clause followed by a writer-oriented main clause that conveys the AI's principal claim or evaluation.

(8) WO: ...*In conclusion, while 16 weeks may seem limited at first glance, it can actually promote focused learning, active engagement with the material, independent...*

In excerpt (8), the connective *While* establishes a concessive background (...16 weeks may seem limited...) that legitimizes opposing expectations before transitioning to the main evaluative statement (...it can actually promote focused learning...). This structure demonstrates how *While* contributes to argumentative coherence through concession and rebuttal, which allows the writer to acknowledge potential counterarguments while intensifying their own position. The pattern reflects Hyland's (2005) description of writer-oriented metadiscourse, where concessive connectives facilitate stance construction by managing the interplay between alternative perspectives or evaluation.

The sentence-medial *while* (22 content-oriented and 2 writer-oriented instances) in the subsequent clause shows a more distinctive stance orientation. This distribution indicates that the connective primarily supports local semantic cohesion rather than projecting evaluation or authorial stance.

(9) CO: ...*Ultimately, finding an optimal balance between instructional time and assessments is essential to ensure quality education while considering factors unique to each educational system...*

In excerpt (9), *while* integrates a preceding clause that specifies a contextual condition (...considering factors unique to each educational system...), marked as content-oriented. This type of *while*-clause fulfills what Blühdorn (2008) terms syntactic subordination, which foregrounds propositional linkage and logical dependency rather than meta-discursive or evaluative commentary.

(10) WO: ...*lowering the voting age can provide young people with an opportunity for political participation from an earlier stage of life while also fostering civic engagement among youth.*" .."I believe that in Taiwan's law, individuals are considered full adults at...

By contrast, in excerpt (10), *while* connects two propositions that express the writer's stance toward youth empowerment. The evaluative

element is realized through the adjective “civic” and the lexical choice “engagement”, both of which carry positive connotations of active citizenship. Here, *while* functions as a stance-marking connector, intensifying the writer’s approval of the underlying social goal. Despite its limited frequency, this pattern demonstrates that the AI occasionally deploys *while* to strengthen positive evaluation and assert authorial perspective.

Only three instances in the subsequent clause were reader-oriented. It serves as the clarification that invite mild reader reflection without direct interaction.

(11) RO: *...natural habitats. By implementing these improvements, zoos have the potential to become centers for education, conservation, and ethical animal care while still allowing people to learn about and appreciate wildlife. Now it's your turn! How would you respond?"...*

(12) RO: *...foreign countries like the UK and the USA. It's true that assessments can be scheduled outside of those 12 weeks. However, it's important to consider that different educational systems have different approaches to assessments. In Taiwan's education system,...*

In excerpt (11) and (12), the *while*-clauses serve as reader-oriented cues that gently acknowledges the reader’s perspective (*allowing people to learn/ it's important to consider*). However, such little instances support Thetela’s (1997) observation that academic writers, including AI, tend to maintain interpretive control rather than engage readers directly. This orientation intensifies the AI’s preference for informational cohesion.

4.2.3 Comparative Interpretation

The combined findings reveal a functional progression across clause positions. In other words, the orientations move from content orientation in the preceding clause to writer orientation in the subsequent clause. This shift underscores how connectives enable the AI to shift from logical organization to evaluative stance. It guides readers through both the propositional structure of the argument. The pattern reflects an underlying rhetorical design: (1) The preceding clause establishes

informational grounding, (2) The subsequent clause asserts perspective and authorial control.

Connectives (*While* (sentence-initial) and *However*) initially structure logical or concessive/contrastive relationships (mostly content-oriented) in the preceding clause (X) and then progress toward writer-oriented evaluation or claim articulation in the subsequent clause (Y) (see excerpt (13)). It exemplifies how the AI constructs coherence through both semantic contrast and stance advancement.

(13) CO/ WO: *...While independent learning is important, It is also crucial for students to engage in structured classroom settings. University classes provide...*

In contrast, the sentence-medial *while* primarily functions as a semantic connector rather than a meta-discursive device. It maintains intra-sentential cohesion without overt stance marking. This aligns with Blühdorn’s (2008) argument that syntactic subordination does not necessarily entail discourse-level hierarchy. That is, a subordinating conjunction like *while* may grammatically link clauses without indicating a rhetorical or evaluative relation. The connective thus sustains textual cohesion but remains limited in its capacity to project interpretation or evaluation. This evidence supports Hyland’s (2005) claim that meta-discourse serves as a dual resource, which is organizational in structuring propositional flow and interpersonal in expressing stance and authorial control.

Type	Dominant Orientation Pattern	Preceding Clause/Subsequent Clause
<i>However</i>	CO → WO	Establish factual or contextual premises/ Present evaluation, claim, or counter-claim
<i>While</i> (sentence-initial)	CO → WO	Providing contextual or concessive background information/ Expressing the main stance or conclusion
<i>while</i> (sentence-medial)	CO → CO	Describing states or conditions/ Maintaining topical continuity or logical simultaneity

Table 3: Comparison of Stance Orientations and Functional Roles of *However* and *While*

Overall, the distribution reveals a functional progression across positions. *However* and sentence-initial *While* typically shift from content orientation in the preceding clause to writer orientation in the subsequent clause. This shows how the AI shifts from describing facts to expressing evaluation. In contrast, sentence-medial *while* remains content-oriented. It emphasizes cohesion and logical continuity rather than stance construction (see Table 3). The findings therefore confirm that the AI's connective use not only organizes textual relations but also simulates the evaluative progression characteristic of human academic discourse.

5. Conclusion

This study examined how the contrastive connectives *however* and *while* function in the AI-human argumentative discourse. Drawing on Hyland's (2005) stance framework and Thetela's (1997) model of evaluative entities, the analysis revealed a consistent rhetorical progression across clauses: from content-oriented organization in preceding clauses to writer-oriented evaluation in subsequent ones. The findings suggest that the AI constructs argumentation through a two-step rhetorical strategy: (1) to establish logical balance, (2) to assert stance. This shows the cohesive and persuasive characteristic of academic writing. These results extend connective research by showing that *however* and *while* perform distinct discourse functions in constructing coherence and projecting stance.

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References

Abdi, O. (2021). The use of discourse connectives in the written academic discourse of students majoring in Arabic and their peers majoring in English. *Arab Journal of Applied Linguistics*, 6(01), p. 32-59.

Blühdorn, H. (2008). *Subordination and coordination in syntax, semantics and discourse: Evidence from the study of connectives*. In C. Fabricius-Hansen & W. Ramm (Eds.), 'Subordination' 'versus 'Coordination' in Sentence and Text. Amsterdam: John Benjamins. p. 59–85.

Eckle-Kohler, J., Kluge, R., & Gurevych, I. (2015, September). On the role of discourse markers for discriminating claims and premises in argumentative discourse. In *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing* (pp. 2236-2242).

Felder, E. (2015). Lexik und Grammatik der Agonalität in der linguistischen Diskursanalyse. *Diskurs-interdisziplinär. Zugänge, Gegenstände, Perspektiven*, 87-121.

Fraser, B. (1999). What are discourse markers?. *Journal of pragmatics*, 31(7), p. 931-952.

Halliday, M. A. K., & Hasan, R. (1976). *Cohesion in English*. Routledge.

Kamalski, J., Lentz, L., & Sanders, T. (2006). Effects of coherence marking on the comprehension and appraisal of discourse. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 28, No. 28). p. 1575-1580.

Maamujav, U. (2025). Relations of linguistic features, rhetorical moves, and writing quality in academic writing of secondary students. *International Journal of Educational Research Open*, 9, 100505. p. 1-14.

Rehbein, I. (2019, August). On the role of discourse relations in persuasive texts. In *Proceedings of the 13th Linguistic Annotation Workshop*. pp. 144-154.

Schiffrin, D. (1987). *Discourse markers*. Cambridge University Press.

Stab, C., & Gurevych, I. (2014, October). Identifying argumentative discourse structures in persuasive essays. In *Proceedings of the 2014 conference on empirical methods in natural language processing (EMNLP)* (pp. 46-56).

Thetela, P. (1997). Evaluated entities and parameters of value in academic research articles. *English for specific purposes*, 16(2), 101-118.