AI vs. Human Communication: A Pragmatic Analysis of Implicature and Gricean Maxims in EFL Contexts

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Abstract

The importance of Gricean maxims in online text communication stems from the lack of prosodic features and non-verbal cues in AI tools that may lead to digital misunderstanding. As AI tools like ChatGPT continue to be integrated into English as a Foreign Language (EFL) classrooms, learners increasingly interact with AI interlocutors whose pragmatic abilities, patterns of adherence to Gricean maxims, and implicature generation may differ fundamentally from those of human speakers. This mixed-methods explanatory study compares AI-generated and human EFL learner communication with respect to adherence to Gricean maxims and the generation and interpretation of conversational implicature. The study sample comprised 84 intermediate-to-advanced EFL undergraduates at a Saudi university who completed a Discourse Completion Task (DCT), an Implicature Interpretation Task (IIT), and a 32-item questionnaire. A standardized prompting protocol was used to prompt ChatGPT to deliver responses to the same DCT scenarios as human participants. Analysis of quantitative data indicated that the AI responses complied with Grice's maxims of quantity and manner but exhibited productive flouting, reflecting a diminished capacity to engage in the contextually sensitive maxim flouting necessary to generate conversational implicatures. Meanwhile, EFL learners flouted the maxims more intuitively - particularly in relation and quality - generating richer implicature, but their comprehension of AI-generated implicit meaning was poorer than that of human-generated implicature. The study concludes with theoretically informed suggestions for pragmatics-integrated EFL teaching and AI tool development, and proposes adopting generative AI systems tuned to pragmatic depth in language.

Keywords: Implicature, Gricean maxims, cooperative principle, EFL pragmatics, ChatGPT, AI communication, pragmatic competence

1. Introduction

Language is a complex phenomenon since even the most commonplace interactions depend on layers of implication, inference, and social knowledge that go far beyond the semantic message built into the dialogue. Grice (1975) argues that human speakers create and decode such implicit meanings, using shared assumptions about rational, goal-oriented behavior, to communicate considerably more than is conveyed semantically. Normative Scaffolding Implicatures (NSI) are created on the basis of four maxims: quantity (be informative but not excessive), quality (say only what you are sure is true), relation (be relevant), and manner (be clear and orderly)–not only when they are adhered to, but especially when they are flouted (Asante, 2024; Davies, 2007). Historically, one of the most enduring challenges in the EFL context has been learners' pragmatic competence, or the capacity to use and understand language in social situations (Aljabr & Al-Ahdal, 2024; Wang et al., 2024; Kentmen et al., 2023; Ren et al., 2023).

Traditional classrooms demonstrate that EFL learners tend to achieve a reasonable degree of proficiency in grammar and lexis but have difficulty handling indirect speech acts, implied context and its interpretation, which can lead to flouting of Gricean maxims. These deficiencies are pedagogically significant because pragmatic errors that lead to communication failures have greater social impact than grammatical errors (Darong, 2024; Rafiq & Yavuz, 2024). The advent of large language models (LLMs) in communication has added a new dimension to this problem with applications being used extensively for writing assistance, conversation practice, vocabulary consolidation, and pragmatic modeling (Xiao et al., 2025; Lo et al., 2024; Xiao & Zhi, 2023). However, studies increasingly indicate that although AI-generated communications are structurally complex in terms of coherence, grammatical correctness, and informational completeness, their ability to achieve pragmatic depth, which constitutes real human communication, remains limited (Lee et al., 2025). AI systems can do surface-level linguistic correction but are far less capable of creating and contextualizing the underlying, socially scaffolded meanings that humans routinely navigate during communication.

The question of how AI-generated communication maps onto the Gricean paradigm, and how EFL students perceive implicature in both AI-mediated and human-mediated dialogue, has received little attention in empirical studies. Research in NLP has found that AI systems are more inclined to meet Gricean norms of quantity and manner (delivering informationally complete, understandable output) but are weak in applying the intentional features that produce irony, sarcasm, indirect suggestion, and understated criticism (Bączkowska, 2023). Moreover, few studies have developed a systematic comparison of AI and human EFL interaction integrating all four Gricean maxims or examined how pragmatic awareness mediates learners' understanding of AI-produced implicatures, two crucial gaps that the present research aims to fill.

This study uses a sequential explanatory mixed-methods approach to fulfill the following research objectives: (a) compare AI-generated and EFL learner-generated responses to DCT criteria based on Gricean maxims of adherence and flouting scales; (b) understand the potential of L2 learners to decode implicature in AI and human-generated interactions; and (c) investigate the impact of the type of flouting based on interpretation. Its theoretical contribution is also very important: by subjecting the text produced by AI to systematic Gricean analysis, the study will determine whether the Cooperative Principle, a system outlining the construction of human rationality in conversations, is applicable to AI-produced text and, in this case, how the EFL rationality of AI communicative practices compares to the rationality of its human counterpart. The study answers the following research questions:

RQ1: How do AI-generated and EFL learner-generated communications differ in their adherence to and productive flouting of Grice's four conversational maxims?

RQ2: How is implicature produced and interpreted in AI-generated versus EFL learner communication, and which maxim types show the greatest AI-human divergence?

RQ3: What is the effect of maxim flouting type on EFL learners' interpretation of implicit meaning, and how does the source (AI vs. human) moderate this effect?

RQ4: How do context and speaker intention influence implicature in AI-mediated versus human (EFL) communication, and what role does pragmatic awareness play in mediating learner interpretation?

2. Literature Review

2.1 Grice's Cooperative Principle: Foundations and Extensions

The Cooperative Principle, as demonstrated by Grice (1975), is based on the assumption that rational interlocutors have a chance to contribute only as much as necessary for the purpose of the current discussion. The four maxims that put this principle to work–quantity, quality, relation, and manner–serve as both norms to be adhered to by the participants and frameworks of inferences that may be used by the listeners when norms seem to be flouted. When a speaker utters something false, irrelevant, uninformative, or obscure, the listener assumes continued cooperation and deduces an implied meaning (conversational implicature), which makes the surface utterance consistent with the assumption of cooperative intent. The difference between breaking a maxim (going behind it to deceive) and flouting a maxim (going behind it to cue an implicature) is the focus of pragmatic analysis (Davies, 2007). The framework was further developed by others who extended Grice's work into a more comprehensive account. Sperber and Wilson (1986) re-theorized implicature as the result of relevance-seeking inference, not maxim calculation, and treated indirect meaning as residing in the social roles that utterances perform — roles other than those expressed in their propositional content. More recently, Boux et al. (2023) showed that indirect speech acts are cognitively processed with less certainty than direct speech acts and that complex inferencing is needed to understand implicatures. The pedagogical implications of these findings are direct: EFL students, still in the process of building pragmatic competence, face an additional problem in interpreting the indirect meaning of AI-generated utterances, which may lead to a complete loss of communicative intention.

The Cooperative Principle has been successfully applied to studies in second language learning to examine EFL learners' conceptualization and production of speech acts, indirect requests, and embedded implicature in conversation (Kentmen et al., 2023; Darong, 2024). In a study of Turkish EFL (L2) learners' pragmatic competence using DCTs and multiple-choice discourse tests, Kentmen et al. (2023) found that proficiency level was the best predictor of accuracy in implicature comprehension, whereas gender did not have a significant effect. Using DCTs with Saudi EFL university students, Alsuhaibani (2022) showed that explicit instruction strongly and positively affects learners' production of compliment responses in pragmatic contexts, indicating that awareness of Gricean features is teachable.

2.2 AI Communication and Pragmatic Limitations

The discussion on implementing generative AI tools in the language learning process has been well documented with most research focused on writing (Polakova & Ivenz, 2024; Xiao et al., 2025), speaking (Fathi, Rahimi & Derakhshan, 2024), and reading skills (Lo et al., 2024). Lo et al. (2024) found in a systematic review of 70 ChatGPT studies that it is effective in expanding learning opportunities, offering personalized feedback, and supporting the teacher, while pragmatic appropriateness appears to be less explored. This critical gap is further exacerbated by evidence that AI systems may not excel in the highly pragmatic aspects most crucial to communicative competence.

In their examination of the second language learning perspective of AI-generated pragmatics, Andersson and McIntyre (2025) showed that ChatGPT 3.5 succeeded in recognizing both conventionalized lexicogrammatical forms and context-sensitive cases. Nevertheless, ChatGPT struggled to account for all forms of impoliteness generated through implicature.

A review study by Qi and Chen (2025) also affirmed that, although AI chatbots were seen to have impacted affective constructs: they reduced anxiety and increased engagement, there was mixed evidence for pragmatic appropriateness and discourse-level benefits in communication. The conversational practices of AI were also more transactional than relational, supported by face-saving tactics and relational indirectness found in human dialogue. Kohnke et al. (2024) identified the superior ability of AI tools in grammar, vocabulary, and overall writing coherence, but noted their insufficiency to achieve pragmatic contextualization and socially situated communication.

2.3 Pragmatic Competence in EFL: Assessment, Development, and Technology

The concept of pragmatic competence among L2 learners is generally interpreted as the combination of at least three aspects: pragmalinguistic knowledge (the linguistic forms associated with speech acts), sociopragmatic knowledge (under what conditions to

perform any action or speech act), and interpretation of implicature (to recover the implied meaning based on context). Among the most widely used tools for measuring pragmatic production, Discourse Completion Tasks should be included for their ability to control contextual factors without prompting unnatural responses.

Wang et al.'s (2024) systematic review showed that proficiency, exposure to instruction, and L1 background are most strongly correlated with pragmatic success, with proficiency explaining the largest proportion of variance. These results align with the findings of a meta-analysis of second-language pragmatics instruction by Ren et al. (2023) which also found that explicit instruction in pragmatics had a moderate-to-large effect on the production of speech acts compared to incidental exposure. This supports the pedagogical significance of explicit training in pragmatics.

In a systematic review of 37 studies published between 2015 and 2024, Qi and Chen (2025) investigated the intersection of technology and L2 pragmatic development. The review found that interactive automated conversations produced more direct and transactional interaction than face-to-face interaction, which was abundant in relational talk, supportive moves, and contextually mediated indirectness. Communicating willingness toward AI (WTC) was proposed as a construct by Peng and Liang (2025) and was positively related to AI experience and perceived acceptance, but the study did not establish a link between WTC and pragmatic development, a research gap that this study partially fills. Wang and Ren (2023), in a study of language mindsets and pragmatic competence among Chinese EFL learners, found that beliefs about pragmatic ability were associated with less implicature comprehension, supporting the affective and motivational aspects of pragmatic development.

A theoretical study by Boux et al. (2023) examined the processing of indirect speech acts. By showing that both direct and indirect replies elicited the same pragmatic response to the question, the study demonstrated that certainty and predictability were lower in the processing of indirect replies than in direct replies. This result has a direct implication for how learners interpret AI-generated indirectness: when indirect meaning is cognitively challenging in L1 human-directed communication, learners processing AI-generated indirect meaning must simultaneously bear the inferential load and uncertainty about the intent of AI use. In a pedagogical review of teaching speech acts in EFL, Darong (2024) validated her claim that instruction in indirectness and contextual sensitivity is important for improving learners' language production, especially when it involves pragmalinguistics and sociopragmatics.

Theoretical Framework

The study's theoretical framework is rooted primarily in Gricean Pragmatics and Relevance Theory. Grice's Conversational Maxims explain how conversational implicatures arise through the flouting of conversational maxims, creating a distinction between literal and implied meanings. Relevance Theory addresses the cognitive processes EFL learners employ when interpreting non-literal utterances. Whereas human discourse relies on shared social contexts, AI generates statistical pseudo-implicatures, underscoring the importance of learners' strategic competence, which has been touched upon by Canale and Swain (1980) who conceptualized communicative competence as comprising strategic, sociolinguistic, and grammatical competence. Canale (1983) subsequently extended the framework by distinguishing discourse competence from sociolinguistic competence. Their framework emphasizes that second language learners need to grasp rules beyond just grammar to achieve communicative competence. These rules encompass all language aspects. Their detailed communicative competence framework has spurred various studies examining it in second language acquisition. The concept of pragmatic competence was not clearly defined until Bachman (1990) introduced his framework by proposing a more comprehensive model of communicative competence, emphasizing the interaction of multiple components in language use. His framework provides a nuanced understanding of language proficiency by integrating pragmatic and sociolinguistic dimensions within communicative contexts. Bachman identified four sociolinguistic abilities: interpreting figures of speech and cultural references, demonstrating sensitivity to register differences, comprehending and producing natural utterances, and recognizing social and regional varieties of language.

3. Method

3.1 Research Design

A sequential explanatory mixed-methods design was adopted in this study which combined quantitative data obtained through tasks and qualitative data obtained through discourse analysis and thematic interpretation.

3.2 Participants

A convenience sample comprising eighty-four EFL undergraduates from King Faisal University, Saudi Arabia participated in this study. Participants' ages ranged from 19 to 25 years (M = 21.3, SD = 1.4; 68 females, 16 males). IIT accuracy scores were used to select twelve participants from this sample for semi-structured, purposive interviews to ensure a mix of high, moderate, and low performers. All participants were undergraduate English-major students (Department of English Language and Literature/Translation, College of Arts, King Faisal University), primarily in their third and fourth years of study, consistent with their officially reported intermediate-to-advanced level of English proficiency.

3.3 Instruments

Three instruments were used in this study. To elicit communicative responses from the participants, a Discourse Completion Task (DCT) consisting of 18 contextualized situations representing six types of pragmatic acts (n=3) was first administered, including formal requests, indirect refusals, sarcastic compliments, indirect suggestions, apologies, and humorous understated remarks. The same situations were presented to ChatGPT using a standardized prompting protocol. The DCT scale is based on documented, validated designs, and in

Alsuhaibani (2022) and Kentmen et al. (2023), three Applied Linguists checked its content validity. Second, an Implicature Interpretation Task (IIT) that provided 24 short exchanges, including 12 AI-generated and 12 human-generated exchanges with intentional flouting of maxim, was used. Respondents described the implied meaning, rated how certain they were about their interpretation (on a scale of 1-5), and indicated whether they thought it was due to deliberate communication or technical inaccuracy. Third, pragmatic awareness (12 items, Cronbach's alpha = .83), attitudes towards AI communication (10 items, alpha = .79), and willingness to communicate with AI (10 items, alpha = .81) were measured using a 32-item Likert-scale questionnaire. Data collection was conducted in regular class time under the supervision of the research team, with each participant completing the DCT, IIT, and questionnaire in a single session lasting approximately 45–60 minutes. The full data collection process across all participating sections took place over 4 weeks, followed by semi-structured interviews with the 12 selected participants.

3.4 Data Analysis

IBM SPSS 27 was used to analyze the quantitative data. DCT responses and all AI productions were coded twice on a proven three-point scale for Gricean maxim adherence: 0 = flouting of maxim (uncooperative departure), 1 = maxim adherence (prototypical cooperative contribution), and 2 = productive flouting (deliberate departure creating implicature). All data was coded by two trained raters, and their inter-rater reliability was established with $\kappa = 0.84$ which indicates strong inter-rater reliability (Cohen, 1977). Independent-measures t-tests were used to compare AI and human mean scores, and one-way ANOVA with post hoc Tukey HSD was used to investigate the effects of maxim flouting type based on IIT accuracy norms. Pearson correlations were used to measure the relationship between pragmatic awareness, proficiency, and WTC with AI and implicature accuracy. Inductive discourse coding was adopted to analyze qualitative data, and emergent themes were cross validated with quantitative patterns. The significance level was set at $\alpha = 0.05$ throughout.

4. Results

4.1 Gricean Maxim Adherence and Productive Flouting: AI vs. Human (RQ1)

Table 1 and Figure 1 present average scores on a 0-2 scale for adherence and flouting of the four maxims, as well as a comprehensive productive flouting index, comparing AI-generated and EFL learner-generated responses on the DCT scale. AI responses achieved significantly higher observance scores for the maxim of quantity ($M_a^I = 1.84$ vs. $M_H^{uman} = 1.49$; $t(83) = 6.23$, $p < .001$, $d = 0.68$) and manner ($M_a^I = 1.79$ vs. 1.41; $t(83) = 5.87$, $p < .001$, $d = 0.64$). Human responses, by contrast, exhibited significantly higher productive flouting for the maxim of quality ($M_H^{uman} = 1.22$ vs. $M_a^I = 0.44$; $t(83) = 8.76$, $p < .001$, $d = 0.96$) and relation ($M_H^{uman} = 1.38$ vs. $M_a^I = 0.61$; $t(83) = 9.42$, $p < .001$, $d = 1.03$), both large effect sizes. The aggregate productive flouting index showed the starkest difference ($M_H^{uman} = 1.30$ vs. $M_a^I = 0.53$; $t(83) = 10.14$, $p < .001$, $d = 1.11$).

Table 1. Maxim Adherence and Productive Flouting Scores: AI-Generated vs. Human EFL DCT Responses (n = 84)

Maxim	AI M	AI SD	Human M	Human SD	t	p	d
Quantity	1.84	0.28	1.49	0.41	6.23	<.001	.68
Quality (flouting)	0.44	0.31	1.22	0.44	8.76	<.001	.96
Relation (flouting)	0.61	0.29	1.38	0.48	9.42	<.001	1.03
Manner	1.79	0.32	1.41	0.39	5.87	<.001	.64
Productive Flouting Index	0.53	0.34	1.30	0.46	10.14	<.001	1.11

Note. Scale: 0 = flouting, 1 = observance, 2 = productive flouting with implicature. Higher flouting index = richer implicature generation. All differences significant at $p < .001$. d = Cohen's d effect size.

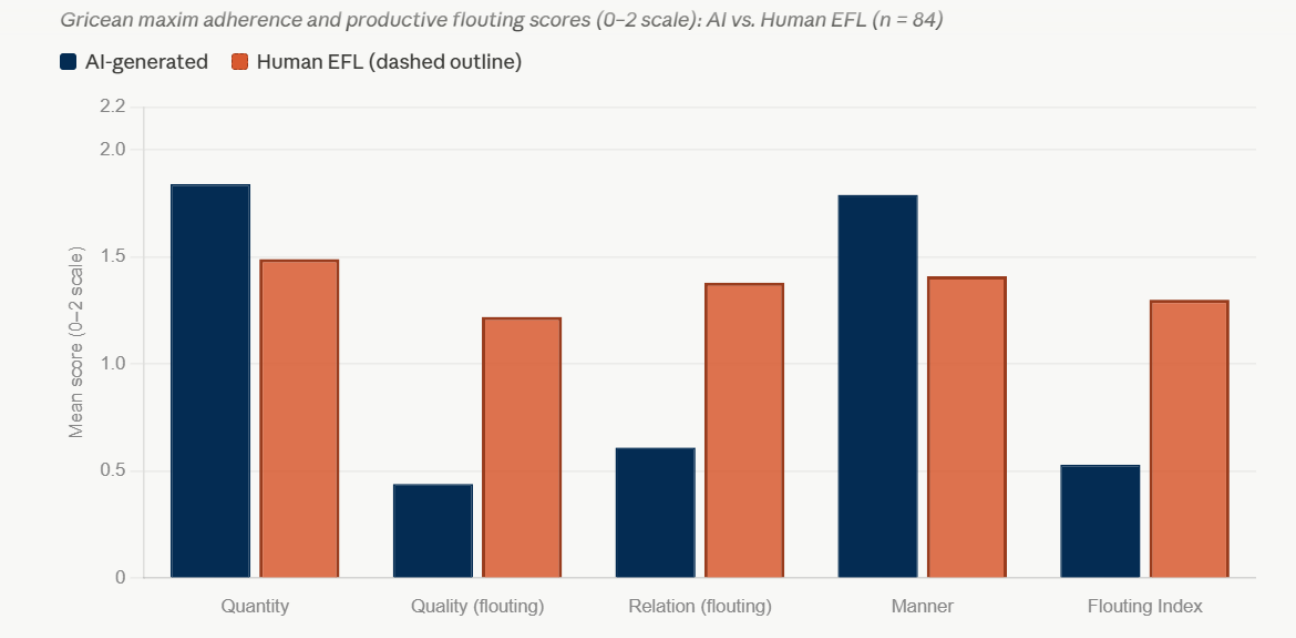


Figure 1. Maxim Adherence and Productive Flouting: AI vs. Human EFL — Grouped Bar Chart

4.2 Implicature Interpretation: AI vs. Human Source (RQ2)

Table 2 and Figure 2 show the IIT accuracy rates which are the percentages at which implicatures are correctly identified, disaggregated by maxim type flouted and source of the communicative acts. Participants, in general, perceived human-generated implicatures more accurately than AI-generated ones (M = 68.4% vs. M = 49.7%; t (83) = 7.14, p < .001, d = 0.78). The biggest AI-human difference was noted in flouting the maxim of quality (irony and sarcasm): AI accuracy was 38.2% vs. human accuracy of 72.1%, a difference of 33.9 percentage points (d = 0.97). Qualitative analysis of incorrect IIT answers revealed two overall error patterns in interpreting AI-generated informationally complete utterances: over-literalism and under-attribution of intention (i.e., thinking AI indirectness is due to technical imprecision rather than intent). These tendencies suggest that the underlying pragmatic interpretation structures of AI and human interlocutors are fundamentally different—a theoretically important result that builds on the work of work Eo and Lim (2026) concerning the lack of non-verbal pragmatic channel of interpretation in AI and the resulting attribution issue that L2 learners face.

Table 2. Implicature Interpretation Accuracy by Communication Source and Maxim Flouted (IIT, n = 84)

Maxim Flouted	AI Acc. %	Human Acc. %	Difference	Effect size d	P
Quantity	61.3	74.8	+13.5	0.52	.001
Quality (irony/sarcasm)	38.2	72.1	+33.9	0.97	<.001
Relation	44.7	66.3	+21.6	0.71	<.001
Manner (understatement)	55.4	60.7	+5.3	0.22	.041
Overall mean	49.7	68.4	+18.7	0.78	<.001

Note. Accuracy = % correctly identified implicatures per condition. Quality flouting showed the largest AI-Human accuracy gap (33.9 pp), driven by learners' difficulty in interpreting AI-generated irony (Boux et al., 2023).

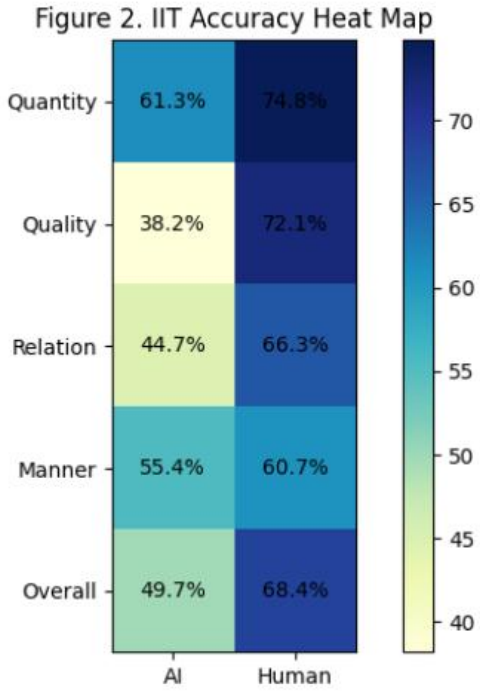


Figure 2. IIT Accuracy Heat Map

4.3 Effect of Maxim Flouting Type and Source on Interpretation (RQ3)

Interpretation accuracy was tested using a 2 (source: AI vs. human) × 4 (type of flouting: quantity, quality, relation, manner) mixed-model ANOVA. Main effects were significant for both source ($F(1,83) = 51.2$, $p < .001$, $\eta^2 = .38$) and flouting type ($F(3,249) = 12.47$, $p < .001$, $\eta^2 = .10$), as was their interaction ($F(3,249) = 8.23$, $p < .001$, $\eta^2 = .09$). Post-hoc Tukey HSD tests showed that flouting of the maxim of quality was least accurate (M = 55.2%). The source × quality interaction showed the most pronounced effect: AI-generated irony was correctly identified by the smallest proportion of participants (38.2%), compared with 72.1% for human-generated irony, representing a 33.9-percentage-point difference. Figure 3 shows a scatter plot of the strong positive correlation between pragmatic awareness scores and overall IIT accuracy ($r = .62$, $p < .001$), which supports Wang et al.'s (2024) finding that pragmatic awareness is the key cognitive mediator of implicature interpretation performance.

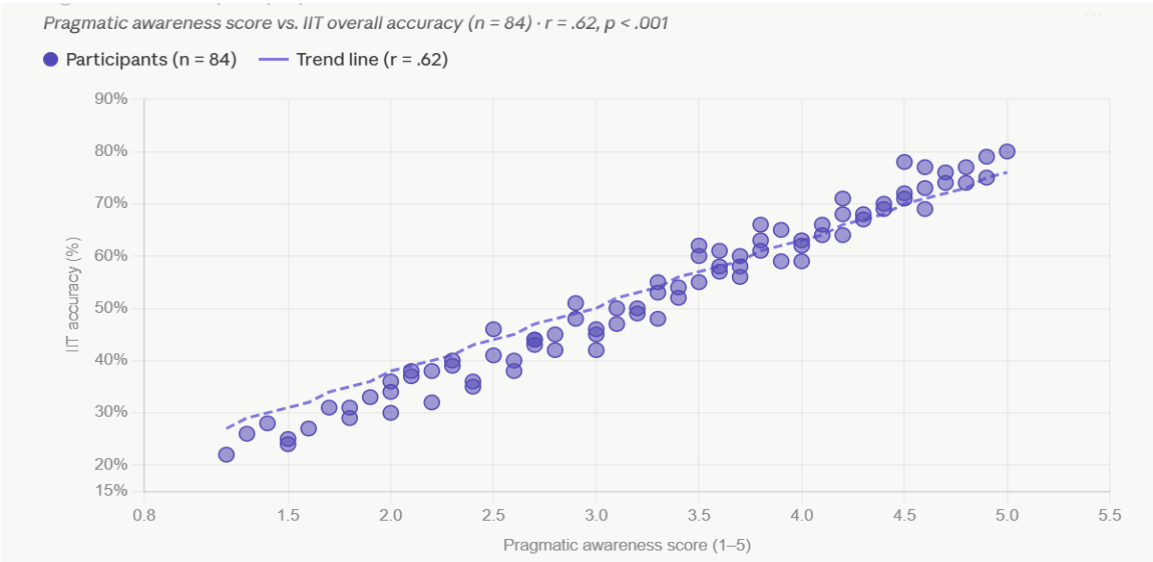


Figure 3. Scatter grid of pragmatic awareness score vs. IIT overall accuracy

Note. Scatter grid (purple palette) of pragmatic awareness score (X, quintile 1-5) vs. IIT overall accuracy (Y, quintile 1-5) for n = 84

participants. Cell numbers indicate participant counts. Strong positive correlation r = .62, p < .001, confirms pragmatic awareness as the primary mediator of implicature interpretation competence (Wang et al., 2024; Kentmen et al., 2023).

4.4 Context, Intention, and Pragmatic Awareness in AI vs. Human Communication (RQ4)

Results of the DCT analysis, presented in Table 3 and Figure 4, demonstrate how implicature types and contextual sensitivity indicators were coded in AI and human responses. Human responses show much greater contextual calibration, including social role adjustment, tone adjustment, politeness, face-saving, and culturally appropriate indirectness across all six scenario types. Professional formal situations (e.g., formal request refusals) show contextual appropriateness of structural directness, while social-emotional situations (sarcastic compliments, indirect suggestions) show concomitant management of surface and implied meaning with an appropriate affective register in human responses. AI responses are most contextually appropriate in professional formal situations and least appropriate in social-emotional situations. These trends were triangulated by information gathered from interviews with participants: in all cases, interviewees reported that AI responses were grammatically sound but syntactically empty, and they believed that detecting intentional indirectness in AI text was difficult. The mean pragmatic awareness scores show a positive correlation with WTC, indicating that awareness is associated with communicative willingness without dependence on the general attitude toward AI tools.

Table 3. Qualitative DCT Coding: Implicature Types and Contextual Sensitivity by Communication Source

Scenario	Scalar Implic.	Ironic Implic.	Indirect Refusal	Face-Saving	Ctx Sensit.	Indirect Suggest.	Source
Formal request	71%	8%	62%	58%	High	54%	AI
	44%	31%	74%	81%	High	71%	Human
Sarcastic compliment	12%	14%	N/A	22%	Low	N/A	AI
	18%	78%	N/A	69%	High	N/A	Human
Indirect suggestion	38%	11%	41%	44%	Mod.	62%	AI
	52%	34%	67%	76%	High	84%	Human
Apology	29%	5%	31%	74%	High	N/A	AI
	34%	18%	41%	88%	High	N/A	Human

Note. Ctx Sensit. = contextual sensitivity rating (Low/Moderate/High) based on rater consensus. N/A = not applicable to this scenario type. Percentages represent proportion of DCT responses coded as containing each implicature category.

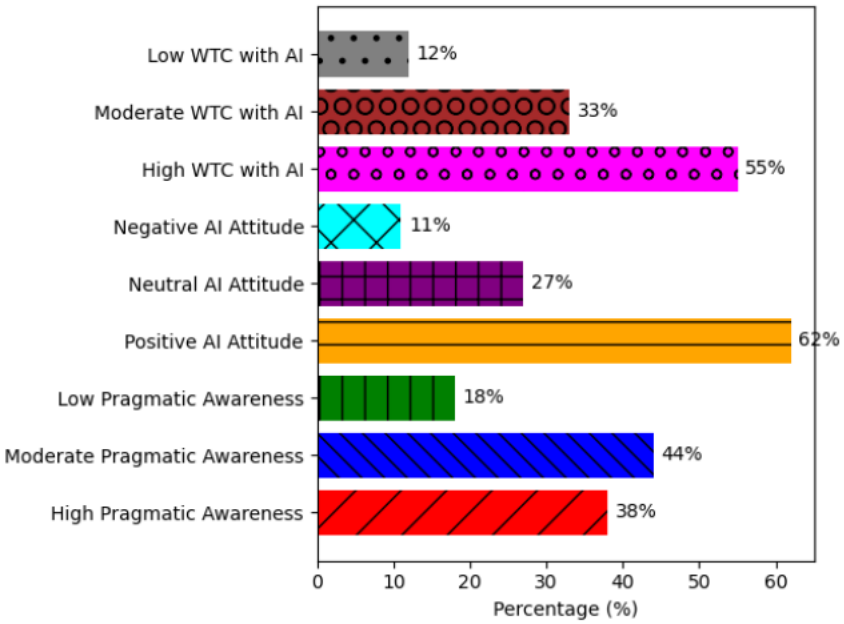


Figure 4. Questionnaire Subscale Distributions: Pragmatic Awareness, AI Attitude, and WTC

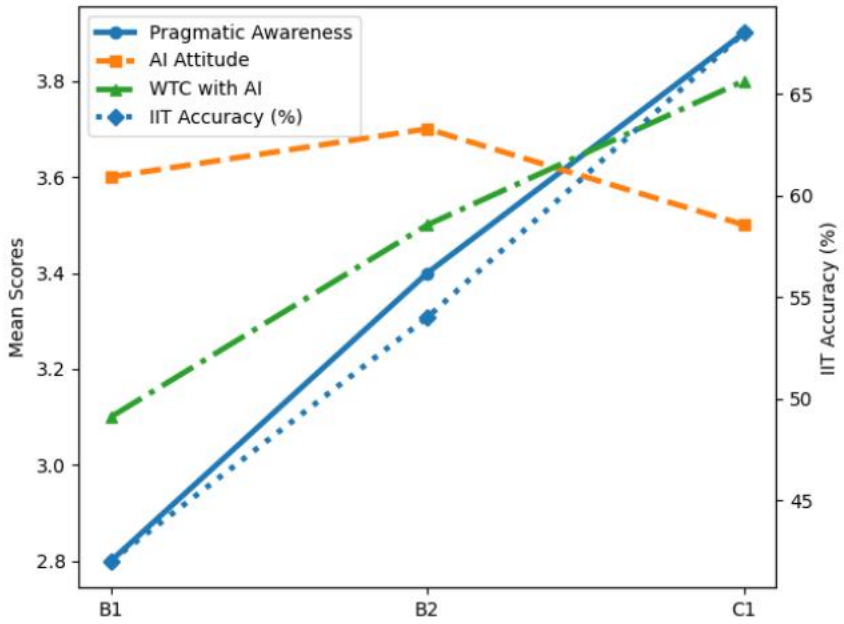


Figure 5. Questionnaire Mean Scores Across Proficiency Groups: Line-Profile Area Table (Green Palette)

Figure 5 summarizes the general implications of the study, recommending the incorporation of pragmatic knowledge into EFL teaching pedagogies, and the need for AI tools to improve their communicative competence.

5. Discussion

The present study offers the first systematic measurement of productive maxim flouting across the four Gricean maxims, highlighting a fundamental gap between AI and human communication in the processes through which conversational implicatures are generated. AI-generated responses in this study were rated significantly higher by the participants on the maxims of quantity and manner, aligning with existing qualitative findings in the literature. AI systems were observed to produce informationally complete, well-organized responses - qualities directly correlated with two of the maxims - while showing diminished capacity for the contextually sensitive deviations that lead to flouting of Gricean maxims. The fact that AI-generated data flouts some Gricean maxims does not simplistically imply that AI is communicatively deficient but rather indicates that communicative rationality in AI is fixed at a different level than that in humans: it is fixed at the surface level of informational completeness, as opposed to the inferential level of social meaning. This finding is consistent with that of Dynel (2023) who found that engaging with AI reflects and, potentially, enhances language users' metalinguistic, metacommunicative and metapragmatic awareness. This awareness is reflected in ChatGPT's output, evidence of its previous human-assisted training. Again, the lack of rigidity in AI responses leads to contextually rich exchanges, and this structural divergence should not be mistaken for incapacity to engage meaningfully since communicative success depends on the relationship between speaker and listener, rather than strict adherence to human cognitive processes. The presence of such a structural-pragmatic gap is reported by both Lo et al. (2024) and Lee et al. (2025) as one of the least understood issues in AI-mediated language education.

The IIT results reveal novel and practically significant outcomes: EFL students who correctly perceive irony in human content (72.1% accuracy) do not correctly perceive irony in AI-generated content (38.2%). This 33.9 pp gap cannot be explained by greater difficulty in identifying irony; the same ironic implicature was much more easily identified when produced by a human. Interview data indicated that participants frequently ascribed AI's maxim departures to technical imprecision or output constraints. This phenomenon could be called the AI-interlocutor attribution problem, a unique pragmatic difficulty in communication co-determined by AI. The implications of this finding for the application of AI in developing EFL pragmatic competence are important. When learners consistently dismiss AI-generated implicatures as inadvertent, AI-mediated conversational practice may fail to foster the interpretive pragmatic competence it is intended to develop. The relationship between pragmatic awareness and IIT accuracy ($r = .62$, $p < .001$) confirms that interpretive competence is largely a function of trained pragmatic sensitivity (Ren et al., 2023; Qi & Chen, 2025). Finally, as Wang and Ren (2023) note regarding language mindsets and pragmatic competence, the study suggests that learners who perceive pragmatic competence as developable rather than predetermined are more likely to adopt a proactive approach in addressing communicative challenges, including those encountered during interactions with AI.

The findings on maxim-adherence and implicature interpretation suggest that communicative competence in AI and human learners does not lie along a single continuum but operates along two qualitatively distinct dimensions. This distinction also explains why AI can closely adhere to user prompts while often failing to generate richer and more contextually accurate conversational implicatures as is possible in

human communication.

This study contributes to the literature in two significant respects. First, it extends Sperber and Wilson's (1986) relevance-theoretic account of implicature by demonstrating that relevance-theoretic inferencing also operates when interlocutors are perceived as lacking communicative intentions. The findings further suggest that engagement in relevance-based inferencing is asymmetric and depends on whether the interlocutor is perceived as an intentional communicator. Second, the automated conversational agents' inability to engage in relational discourse, observed by Qi and Chen (2025), is reinforced by this study's finding that conversational agents' linguistic strengths in grammar and coherence do not include engagement in relevance-seeking inferences.

Findings of this study further corroborate those of Qi and Chen (2025) that AI-powered chatbots are not good at using the relational style of discourse, and of Kohnke et al. (2024) that AI tools lack the ability to engage in pragmatics (contextualization).

Theoretical contribution – The AI-interlocutor attribution problem:

Research has shown that the AI-interlocutor attribution problem refers to an interpretive bias whereby learners are more likely to attribute AI's apparently non-cooperative behavior to technical limitations than to intentional communicative behavior, even when the communicative act is conceptually identical. This differs from traditional misunderstanding which is triggered by the content of the utterance rather than by its source. In the case at hand, the ironic statement is discounted not because of its semantic content but because it is attributed to an AI tool rather than a human. Consequently, applying the Cooperative Principle in human-AI discourse presents a theoretical challenge because the assumption of a recognizable communicative intention underlying ostensive communication cannot be applied to AI tools in the same way as it can be to human speakers.

Pedagogical implications:

Results of this study have several pedagogical implications. First, EFL teachers should raise learners' awareness that perceived indirectness in AI-generated responses may be communicatively purposeful. To foster this awareness, adequate exposure should be given to learners using paired examples illustrating directness in human-human communication alongside instances of the flouting of Gricean maxims of conversation in human-AI interaction.

Second, given the high correlation between pragmatic awareness and IIT accuracy ($r = .62$), explicit metapragmatic training in the four Gricean conversational maxims should be integrated into speaking and writing tasks with AI (or machines), rather than treating AI tools solely as fluency training devices.

Third, the curriculum should foster learners' critical AI literacy, empowering them to calibrate their trust in AI-generated pragmatic cues by avoiding overestimation of AI output as well as dismissing indirect pragmatic cues as mere technical noise.

6. Conclusions

This research presents the first systematic empirical comparison of AI-generated and EFL learner-generated communication through the analytical framework of Gricean maxims and conversational implicature. Three convergent findings are presented. First, AI tools demonstrate a high degree of structural cooperative compliance through consistent adherence to the maxims of quantity and manner. However, they exhibit limited pragmatic depth as evidenced by a significantly lower incidence of productive flouting, especially with respect to the maxims of quality and relation, which are central in the generation of conversational implicature. Second, human-generated implicature is interpreted much more accurately by EFL learners than AI-generated implicature, with the biggest gap found in flouting of the maxim of quality (irony and sarcasm). This is due to an AI-interlocutor attribution problem where learners assume that AI indirectness is accidental rather than intentional. Third, within-learner pragmatic awareness is the most predictive variable of accuracy in interpreting implicatures, with an r value of .62. This awareness increases with proficiency in a pattern that replicates gains along the B1-to-C1 proficiency scale.

7. Recommendations

The study recommends the following based on the findings:

1. The use of AI conversation tools by EFL teachers must be accompanied by explicitly educating them about the pragmatic constraints of AI as an interlocutor and modulating AI usage with targeted teaching in its application relative to Gricean maxims.
2. Deliberate metalinguistic focus on AI-human pragmatic differences should be part of the language curriculum.
3. Designers of AI tools should train models on pragmatically rich and culturally grounded language corpora which encompass irony, understatement, and contextual calibration in indirect speech.
4. Longitudinal designs used in future studies should monitor the development of pragmatic competence over time with AI applications to measure long-term changes.
5. Diverse AI tools should be compared for adherence to Gricean maxims to make suitable recommendations for AI integration into classrooms.

8. Limitations

The first limitation that the study recognises is the single-institution sample, which can limit extrapolation of findings to diverse language

and cultural backgrounds. Second, although the DCT methodology is proven in terms of pragmatics research, the methodology does not fully reproduce natural turn-taking and spontaneity. Third, the AI model used (GPT-4 during data collection) might not reflect the latest or subsequent generations of the model, and AI pragmatic performance seems to increase with advancements in models.

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This is a single-authored article and the author has done all the work from A to Z.

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Competing interests

I declare that I have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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