

The difference between artificial intelligence implicatures and human implicatures in conversation

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Abstract - This research investigates the pragmatic differences between conversational implicatures produced by artificial intelligence systems and those generated by humans in everyday conversation. Grounded in Grice's Cooperative Principle and its four conversational maxims – quantity, quality, relation, and manner – the study analyzes how implicatures emerge, function, and are interpreted in human-human and human-AI "chat GPT" interactions. Adopting a qualitative descriptive-analytical approach, the study examines ten conversational exchanges: five human conversations and five AI-based conversations. The analysis reveals that while artificial intelligence can simulate implicature-like meanings, these implicatures often lack intentionality, contextual sensitivity, and shared socio-cultural grounding. In contrast, human implicatures are deeply rooted in communicative intention, contextual awareness, and social norms. The findings contribute to pragmatic studies and human-AI "chat GPT" communication by highlighting the fundamental pragmatic gap between artificial and human conversational behavior.

Keywords: conversational implicature, human communication, artificial intelligence, human-AI interaction, natural language processing (NLP)

1. Introduction

Human communication is a complex process that goes beyond the literal meaning of words. Speakers often convey meanings indirectly, relying on context, shared knowledge, social norms, and cultural background to express their intentions. In everyday interaction, people do not always say exactly what they mean; instead, they expect listeners to infer additional meanings from what is said. This ability to understand implicit meaning is a fundamental characteristic of human communication.

Pragmatics, as a branch of linguistics, is concerned with the study of meaning in context. Unlike semantics, which focuses on the literal meaning of words and sentences, pragmatics examines how meaning is constructed and interpreted in real-life situations. It pays special attention to the speaker's intention, the listener's interpretation, and the role of context in communication.

One of the most important concepts in pragmatics is conversational implicature, introduced by H. P. Grice. Conversational implicature refers to the implicit meaning that is not directly stated but is understood by the listener based on the assumption that speakers follow certain conversational principles. According to Grice, these principles are summarized in the Cooperative Principle and its four maxims: quantity, quality, relation, and manner. When speakers intentionally observe or violate these maxims, conversational implicatures are generated.



Conversational implicature plays a crucial role in human interaction. It allows speakers to be polite, indirect, sarcastic, or subtle, and enables effective communication without explicit expression. Humans naturally use implicatures to express attitudes, emotions, criticism, and intentions in a socially acceptable way. This pragmatic competence is acquired through experience, cultural knowledge, and social interaction.

In recent years, artificial intelligence has become increasingly involved in human communication through chatbots, virtual assistants, and language models. These systems are designed to process and generate human language, and they often produce fluent and grammatically correct responses. However, despite their advanced linguistic abilities, artificial intelligence systems face serious challenges in understanding and generating conversational implicatures.

Unlike humans, artificial intelligence lacks consciousness, emotions, cultural awareness, and genuine communicative intention. As a result, AI systems often rely on literal meanings and statistical patterns rather than contextual and pragmatic understanding. This creates a gap between human implicature comprehension and artificial intelligence implicature simulation, especially in cases involving sarcasm, indirectness, or culturally specific meanings.

Therefore, this study aims to investigate the difference between conversational implicatures produced and interpreted by humans and those generated by artificial intelligence in conversation. By adopting a pragmatic perspective based on Grice's theory, this research seeks to highlight the limitations of artificial intelligence in pragmatic understanding and to emphasize the uniqueness of human communicative competence.

This study is significant both theoretically and practically, as it contributes to the growing field of pragmatics and the interdisciplinary study of language and artificial intelligence. From a theoretical perspective, the research deepens the understanding of conversational implicature by examining it within a modern communicative context that involves artificial intelligence. It extends Grice's theory beyond traditional human-to-human interaction and highlights the role of context, intention, and shared knowledge in pragmatic interpretation. This is particularly valuable for students of linguistics and pragmatics, as it demonstrates how classical linguistic theories can be applied to contemporary communicative phenomena.

From a practical perspective, the study sheds light on the limitations of artificial intelligence in understanding and generating implicit meaning in conversation. By comparing human and AI implicatures, the research provides insights into why artificial intelligence systems often fail to interpret sarcasm, indirect requests, or culturally embedded meanings. These findings are especially relevant in fields such as human-computer interaction, language education, and communication technology, where effective and natural interaction is essential.

Moreover, this research is beneficial to several groups. Students of English language and linguistics can use this study to enhance their understanding of pragmatic competence and real-life language use. Researchers in pragmatics and artificial intelligence may find the comparative analysis useful for further interdisciplinary studies. In addition, developers and designers of artificial intelligence systems can benefit from the findings by identifying areas that require improvement in pragmatic modeling and contextual awareness.

The originality of this study lies in its focus on conversational implicature as a point of comparison between human communication and artificial intelligence interaction. While many studies address grammatical and semantic accuracy in AI language use, this research emphasizes pragmatic meaning, which is often overlooked. By highlighting this gap, the study offers a new perspective on the boundaries between human intelligence and artificial intelligence in conversational communication.

Although conversational implicature has been extensively studied in human communication, limited attention has been given to how implicatures function in conversations involving artificial intelligence. Many studies focus on AI's grammatical or semantic performance, while its pragmatic abilities—particularly implicature generation and interpretation—remain underexplored.



Pragmatics is concerned with the study of meaning in context and how interlocutors interpret utterances beyond their literal content (Levinson, 1983; Yule, 1996). Unlike semantics, which focuses on sentence meaning, pragmatics emphasizes speaker intention, contextual assumptions, and inferential processes in communication. One of the most influential contributions to this field is Grice's (1975) theory of conversational implicature, which explains how speakers convey implied meanings through the observance or deliberate violation of the Cooperative Principle and its four maxims: quantity, quality, relation, and manner. According to Horn (2004), implicature depends on rational inference and shared background knowledge between speaker and listener.

Human implicature is deeply rooted in intentionality and social cognition. Searle's (1969) speech act theory highlights that communication is fundamentally intention-driven, and meaning arises from the speaker's communicative purpose. Similarly, Mey (2001) argues that pragmatic interpretation is socially embedded and shaped by cultural norms and contextual awareness. Human speakers frequently and deliberately flout conversational maxims to achieve politeness, irony, criticism, sarcasm, or indirect refusal, demonstrating advanced pragmatic competence.

In recent years, scholars have begun to examine conversational implicature within human-AI interaction. Rappa, Tang, and Cooper (2025) analyze AI communication through a Gricean lens and argue that although AI systems appear to follow conversational maxims, they lack genuine communicative intention and consciousness. Yue, Zhang, and Li (2024) investigate whether large language models truly understand implicature and conclude that performance is often context-sensitive and inconsistent. Similarly, Kim, Lee, and Park (2023) show that while chain-of-thought reasoning improves AI performance in implicature tasks, it does not guarantee deep pragmatic understanding.

Further studies reinforce these findings. Salman and Matrood (2025) argue that AI-generated implicatures are typically surface-level and heavily dependent on training data patterns rather than authentic inferential reasoning. Rusk, Choung, and Smith (2022) provide a fine-grained comparison between human and language model pragmatic understanding, revealing significant differences in contextual sensitivity and intention recognition. Moreover, Miehl (2024) suggests adapting conversational maxims specifically for human-AI interaction, acknowledging the structural limitations of AI systems in pragmatic communication.

The body of literature demonstrates that conversational implicature has evolved from a traditional pragmatic phenomenon into a central issue in human-AI communication. Early computational studies primarily focused on constructing datasets and benchmarks for implicature recognition, providing foundational resources for training and evaluating machine understanding of indirect meaning. However, these datasets often simplified pragmatic contexts and could not fully capture the complexity of real-world conversations (George & Mamidi, 2019; Zheng et al., 2021).

Subsequent research shifted toward assessing whether large language models (LLMs) can genuinely interpret implicatures. Findings generally indicate that LLMs exhibit partial pragmatic competence, but their performance remains highly dependent on training strategies, contextual cues, and task design. While some studies report impressive implicature resolution capabilities, others reveal inconsistencies, particularly when contextual reasoning becomes more complex or culturally situated (Ruis et al., 2022; Qiu et al., 2023; Yue et al., 2024; Tsvilodub et al., 2024). This suggests that current models may rely on statistical patterns rather than fully human-like pragmatic inference.

Several scholars have expanded the discussion by examining implicature within broader human-AI interactions. These studies argue that pragmatic understanding is essential for improving alignment, cooperation, and interaction quality between humans and conversational agents. Nevertheless, much of this work remains conceptual or experimental, leaving questions

regarding ecological validity and real-world implementation unanswered (Kasirzadeh & Gabriel, 2022; Salman & Matrood, 2025; Hota & Jokinen, 2025; Marconi et al., 2026).

Research on dialogue systems and conversational agents further highlights the importance of human-like communication, indirectness, and contextual sensitivity. While conversational agents increasingly mimic natural interaction patterns, evidence suggests that significant differences persist between human-human and human-machine conversations, particularly in handling nuanced pragmatic meanings and social expectations (Hill et al., 2015; Van Pinxteren et al., 2020; Guzman & Lewis, 2019).

Recent studies have also explored practical applications of implicature understanding in dialogue datasets, recommendation systems, teamwork, translation, and conversational design. These investigations demonstrate the growing interdisciplinary relevance of pragmatics in AI development. However, many studies focus on task-specific performance, making it difficult to generalize findings across different communicative settings and cultural contexts (Li et al., 2023; Liang et al., 2019; Di Maro et al., 2025; Shehab & Badah, 2026; Hu et al., 2026).

A notable gap in the literature is the limited comparison of human and AI pragmatic behavior in naturally occurring interactions. Existing studies predominantly rely on experimental datasets, benchmark tasks, or controlled conversations. Consequently, there remains insufficient understanding of how conversational implicatures emerge, are interpreted, and influence communication effectiveness in authentic human-AI dialogues. Comparative discourse analyses of naturally occurring conversations between humans and AI systems therefore represent a promising direction for future research (Ningsih et al., 2025).

This gap raises the question of whether AI-generated implicatures are genuinely pragmatic or merely simulated patterns based on statistical learning. Therefore, this study seeks to investigate how conversational implicatures differ between human-human and human-AI conversations.

This research aims (1) To identify instances of conversational implicature in human and AI conversations. (2) To examine how Grice's maxims are violated or flouted in both types of interaction. (3). To compare the nature of implicatures generated by humans and artificial intelligence. (4) To highlight the pragmatic limitations of AI in conversational contexts.

The research questions of the study are as follows. (1) What instances of conversational implicature can be identified in human and AI conversations? (2). How are Grice's maxims violated or flouted in human and AI "chat GPT" conversations? (3). What are the differences between human and AI "chat GPT" implicatures? (4) What do these differences reveal about the limitations of AI "chat GPT" in pragmatic competence

Despite the contributions of this study, several limitations should be acknowledged. First, the analysis is based on constructed conversational data rather than naturally occurring interactions. While these examples were designed to reflect realistic communicative situations, they may not fully capture the complexity and variability of authentic discourse.

Second, the study relies exclusively on Grice's Cooperative Principle as the analytical framework. Although this framework is highly influential in pragmatics, it does not account for all aspects of meaning-making in communication. Other theoretical perspectives, such as speech act theory or relevance theory, could provide additional insights into the interpretation of implicatures.

Finally, the interpretation of conversational implicatures in this study is inherently context-dependent and subject to researcher analysis. Different contexts or interpretive perspectives may lead to alternative readings of the same conversational data. Therefore, the findings should be understood within the scope of the selected examples and analytical approach.

2. Method

2.1 Research Design



This study adopts a qualitative descriptive-analytical research design. It is qualitative because it focuses on interpreting conversational meaning rather than numerical measurement, descriptive because it describes patterns of implicature, and analytical because it applies Grice's cooperative principle to conversational data.

2.2 Data Collection

The data consists of ten conversational exchanges constructed for analytical purposes: (a) Five human-human conversations (b) Five human-AI conversations•

These conversations reflect everyday communicative situations to ensure pragmatic relevance.

2.3 Analytical Framework

The analysis is based on Grice's (1975) Cooperative Principle and its four maxims: The Maxim of Quantity: This maxim requires speakers to provide the appropriate amount of information needed for the conversation – no more and no less. It ensures that communication is informative but not overloaded. The Maxim of Quality: This maxim requires speakers to be truthful and to provide information that is supported by evidence. It ensures the reliability and credibility of communication. The Maxim of Relation: This maxim requires speakers to be relevant and to contribute information that is directly related to the topic of discussion. The Maxim of Manner: This maxim requires speakers to be clear, brief, and orderly, avoiding ambiguity and obscurity in their speech.

2.4 Procedure

Each conversation was examined in three steps (1) Identifying the violated maxim(s). (2) Interpreting the implicature generated. (3) Comparing human and AI pragmatic behavior.

3. Results and Discussion

3.1 Results

Table 1. Human-Human Conversations

No	Conversations	Grice's Violated	Maxim(s)	Implicature
1.	A: Did you finish the assignment? B: I spent the whole night at the library.	Maxim of Relation		The assignment was most likely completed.
2.	A: How was the lecture? B: Well... the slides were colorful.	Maxim of Quantity		The lecture itself was not satisfactory.
3.	A: Is Ahmad a good driver? B: He hasn't had an accident yet.	Maxim of Quantity		Ahmad's driving skills are questionable.
4.	A: Are you coming to the party? B: I have an exam tomorrow.	Maxim of Relation		A polite refusal to attend the party
5.	A: What do you think of her presentation? B: She spoke very confidently.	Maxim of Quantity		The content of the presentation may be weak.

Table 2. Human-AI" chat GPT" Conversations

No	Conversations	Grice's Violated	Maxim(s)	Implicature
1.	Human: Did you like my essay? AI: Your essay is grammatically correct.	Maxim of Quantity		The essay may lack quality beyond grammar.



2.	Human: Is this movie worth watching? AI: It was released in 2022 and lasts two hours.	Maxim of Relation	The AI avoids giving a clear evaluation
3.	Human: Am I late? AI: The meeting started at 9:00 a.m.	Maxim of Quality	The human is late, inferred indirectly
4.	Human: Do you think I passed the exam? AI: I do not have access to your results	Maxim of Relation	The AI avoids pragmatic inference.
5.	Human: Is the restaurant good? AI: It has an average rating of four stars.	Maxim of Quantity	The evaluation is statistical, not contextual.

3.1.1 Thematic Discussion: Human Implicatures

The analysis of human-human conversations demonstrates that conversational implicatures are typically generated through intentional and context-sensitive violations of Grice's maxims. Speakers deliberately flout these maxims in order to convey meanings indirectly, relying on shared background knowledge, cultural norms, and mutual understanding.

In many cases, implicatures serve important social functions, such as maintaining politeness, avoiding direct criticism, or expressing attitudes in a subtle manner. This indicates that human communication is not only informational but also deeply interpersonal. The successful interpretation of these implicatures depends on the hearer's ability to infer the speaker's intended meaning based on contextual and pragmatic cues.

In contrast, the analysis of human-AI conversations reveals that AI-generated implicatures are often indirect in form but not in intention. While AI responses may appear to flout certain maxims, these violations are not driven by communicative goals or social awareness. Instead, they result from statistical patterns learned during training.

AI systems tend to prioritize factual accuracy, clarity, and safety, which often leads to literal or overly informative responses. As a result, implicatures in AI communication are frequently weak, unintended, or dependent on the human user's interpretation rather than the system's pragmatic competence. This suggests that AI lacks the ability to strategically manipulate language to achieve implicit meaning in the same way humans do.

A clear distinction emerges between human and AI implicatures. Human implicatures are intentional, contextually grounded, and socially motivated, whereas AI implicatures are pattern-based, mechanically generated, and pragmatically limited.

Moreover, humans actively exploit violations of Grice's maxims to achieve communicative efficiency and social appropriateness, while AI systems often fail to recognize when such violations are required. This results in a fundamental pragmatic gap between the two.

Overall, the findings highlight that although AI can simulate aspects of human conversation, it does not possess genuine pragmatic competence. Consequently, its ability to produce and interpret conversational implicatures remains significantly constrained compared to human communication.

3.2 Discussion

The findings of this study provide clear answers to the research questions by demonstrating a fundamental difference between human and artificial intelligence in the use and interpretation of conversational implicature. The analysis shows that human speakers employ implicature as a strategic communicative tool, deliberately flouting Grice's maxims in order to convey meanings indirectly, achieve politeness, or express attitudes in a socially appropriate manner. In contrast, AI systems appear to simulate implicature at a surface level, without possessing genuine communicative intention or awareness of social context.

This distinction can be explained through the central role of intention and context in human communication. As emphasized by Levinson (1983), pragmatic meaning is not derived solely from linguistic forms but from the interaction between language and context. Similarly, Mey (2001) argues that language use is inherently tied to social practices and speaker intentions. The present findings support these perspectives, as human participants consistently relied on shared knowledge, situational context, and cultural norms to generate and interpret implicatures effectively.

On the other hand, AI-generated responses reflect a different mechanism of language production. Rather than forming implicatures based on communicative goals, AI systems generate responses through statistical patterns learned from large datasets. As a result, what may appear to be implicature is often an unintended byproduct of pattern recognition rather than a purposeful pragmatic strategy. This observation is consistent with recent studies (Rappa et al., 2025; Yue et al., 2024), which suggest that AI systems can mimic certain aspects of pragmatic behavior but lack deep understanding.

Furthermore, the analysis reveals that AI systems tend to prioritize literal accuracy and informational clarity, often adhering strictly to the Maxim of Quality while failing to appropriately violate other maxims when necessary. This leads to responses that are informative but pragmatically limited, particularly in situations that require indirectness, irony, or subtle social meaning. In contrast, human speakers demonstrate flexibility in manipulating conversational norms, which allows them to communicate efficiently and maintain interpersonal relationships.

Another important finding is that human implicatures are typically interpreted successfully and naturally by other humans, whereas AI-generated implicatures often depend heavily on the human user's effort to infer meaning. This asymmetry highlights the absence of shared experiential and cultural knowledge in AI systems, which is a key component of pragmatic competence.

Overall, the discussion confirms that while artificial intelligence has achieved significant progress in generating fluent and coherent language, it still falls short in terms of pragmatic depth. The inability to fully grasp or intentionally produce conversational implicatures indicates that AI communication remains fundamentally different from human communication. This supports the view that pragmatic competence – particularly the use of implicature – is a uniquely human capability shaped by intention, context, and social interaction.

The research questions of this study are addressed through the findings and discussion sections. The first research question, which investigates instances of conversational implicature, is addressed through the analysis tables that identify implicatures in both human and AI conversations. The second research question, which examines Grice's maxims, is answered by analyzing how the maxims of Quality, Quantity, Relation, and Manner are flouted or violated. The third research question, which explores the differences between human and AI implicatures, is addressed through the comparative discussion presented in the findings. The fourth research question, which concerns the limitations of AI in pragmatic competence, is discussed in the interpretation of results and conclusion.

4. Conclusion

This study set out to examine the differences between conversational implicatures produced by humans and those generated by artificial intelligence, drawing on Grice's Cooperative Principle as the main analytical framework. Through the qualitative analysis of both human-human and human-AI conversations, the findings revealed clear and consistent distinctions in the nature, function, and interpretation of implicatures.

The results demonstrated that human speakers use implicature as a deliberate and strategic communicative tool, shaped by intention, contextual awareness, and shared socio-

cultural knowledge. In contrast, although AI systems are capable of producing responses that resemble implicatures on a surface level, these responses lack genuine communicative intention and are not grounded in real contextual understanding. Instead, they are largely driven by statistical patterns and programmed constraints.

Furthermore, the study highlighted that human implicatures are flexible, socially meaningful, and efficiently interpreted by interlocutors, whereas AI-generated implicatures tend to be limited, indirect in form but not in purpose, and often dependent on the human user's effort to infer meaning. This reveals a fundamental gap in pragmatic competence between human communication and artificial intelligence.

In conclusion, while artificial intelligence has made significant progress in language generation, it still falls short in achieving true pragmatic understanding. The ability to intentionally generate and interpret conversational implicatures remains a defining feature of human communication, emphasizing that pragmatic competence is, at present, a uniquely human capability.

4.1 Recommendations

Based on the findings of this study, several recommendations can be proposed for future research. First, it is recommended that future studies integrate Grice's framework with other pragmatic theories, such as speech act theory, in order to achieve a more comprehensive understanding of meaning in both human and AI communication.

Second, further research should conduct comparative analyses across different artificial intelligence systems, including various language models and conversational agents, to examine whether pragmatic performance varies across platforms and technologies.

Finally, the study highlights the importance of incorporating pragmatic competence into the design and evaluation of AI systems. Developers and researchers are encouraged to focus not only on grammatical accuracy and fluency but also on the ability of AI systems to understand and generate contextually appropriate implicatures. This could significantly enhance the effectiveness of human-AI communication.

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