

Conversational Implicatures in Medical Discourse: An Analysis of Doctor-Patient Dialogues in Amman, Jordan

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Abstract—Effective communication is crucial in medical practice, and adherence to Grice's conversational maxims (quantity, quality, relevance, and manner) can improve communication between doctors and patients. In medical practice, doctors must provide clear and concise information while being honest about medical conditions and treatment options. It is also essential for doctors to communicate using simple language to ensure that the patients understand. This study analyses conversational implicature considering medical discourse in Amman. Twenty-six observations (tape-recorded doctor-patient dialogues) were randomly selected from private and government clinics in Amman, Jordan. The data was sorted and analyzed using the qualitative method of a six-phase framework. This study identifies the cooperative principles, their functions, and conversational implicature in doctor-patient discourse. Our results indicate the significance of all four conversational maxims in medical discourse, with manner being the most prominent aspect, followed by quality, relevance, and quantity. The function of cooperative principles observed in presenting the concepts of expression, direction, assertion, and declaration enhances the quality of medical discourse and promotes clarification in conversation. We observed that non-cooperative conversational implicatures are more frequently used in the doctor-patient dialogue, flouting Grice's maxims. This flaw could lead to ineffective communication and negative health outcomes. In medical discourse, 66.7% of instances violated the Grice maxim, indicating non-cooperative conversation, while 33.3% involved cooperative implicature. The effective observance of the conversational maxims can positively impact doctors' communication with patients and promote better understanding of medical condition and treatment options that may lead to improved health outcomes.

Index Terms—conversational implicatures, medical discourse, doctor-patient dialogues, Grice's maxim, cooperative principles

I. INTRODUCTION

Language is a crucial tool for human communication, allowing individuals to convey their ideas, thoughts, knowledge, intentions, and emotions to others (Risdiyanto, 2011). Discourse refers to the linguistics of language used to comprehend social interactions and explore language and development within social, cultural, medical, economic, and political contexts (Akinwato & Ogundele, 2021; Statham, 2022). Discourse Analysis (DA) is an approach to analyzing written, vocal, or sign language that examines related speech or written discourse, aiming to integrate linguistic analysis with a social analysis of relations (Bloor & Bloor, 2013; Fryer, 2022). DA is an interdisciplinary approach combining elements from various disciplinary perspectives, such as psychology, sociology, politics, medicine, history, semiotics, linguistics, and cultural studies (Fryer, 2022; Malik et al., 2022; Verschuere & Östman, 2011)

Pragmatics in linguistics concerns the meaning of words transmitted by a speaker and comprehended by a listener in a specific instance of a speaker's deliberate activity (Huda, 2013a). Pragmatics examines how language is perceived in a particular situation rather than merely the literal meaning of words. It entails considering how speakers organize their thoughts in light of the circumstances around their speech, including whom they are speaking to, where they speak, when, and how (Yule, 1996).

The conversational implicature refers to an additional meaning implied when speaking about another item and is a crucial communication feature that individuals should be aware of. The cooperative principle, a Grice (1975) notion, is essential to understanding conversational implicature. It asserts that participants in a conversation work together and try to make their comments pertinent to the conversation. Four maxims make up the cooperative principle: *the maxim of amount* (speak neither more nor less than is necessary), *the maxim of quality* (say what you firmly believe and for which you have proof), *the maxim of relevance* (be relevant to the current discourse), and *the maxim of manner* (be clear, brief, and orderly). The idea of conversational implicature with DA has been examined in some research. In addition to its literal meaning, implicature is a term used in linguistics to describe an expression's meaning. Grice first proposed the concept in 1967, defining it as what is conveyed instead of what is stated (Grice, 1975a). Gazdar described it as

anything that may be inferred from utterances without regard to their reality (Gazdar, 1979). The implicature establishes a link between what has been stated and what has been transmitted. For instance, Channell (1994) studies the use of implicature by speakers in discourse to further their communicative objectives (Channell et al., 1994). Another study explains the function of implicature regarding reference and deixis (Clark & Marshall, 1981). Similarly, the processes by which speakers conclude and how they employ implicature in discourse have also been studied (Levinson et al., 1983).

Grice distinguished between two types of conversational implicature: Generalized Implicature and Particularized Implicature. A generalized conversational implicature emerges without any specific essential circumstance or setting. No unique context-specific information is mentioned during this wide conversational implicature (Grice, 1975b). On the other hand, the particularized implicature depends on particular context elements and is only understood to be obtained in certain circumstances (Gibbs Jr & Moise, 1997).

The following information is used to understand implicatures: (1) the conventional meaning of the words used, together with the identity of any references that may be involved (2) the cooperative principles (present expression, direction, assertion, and declaration to improve medical discourse and clarify the conversation) and their maxims (3) the context, linguistic or otherwise, of the utterance (4) other items of background knowledge and (5) the fact (or supposed fact) that all relevant items falling under the previous headings are available to both participants and both participants know or assume this to be the case (Davis & Davis, 2016; Zalta et al., 1995).

Medical discourse between doctors and patients is crucial for gathering information, making diagnoses, creating plans, and attaining compliance. Poor communication between doctors and patients can lead to adverse outcomes such as misunderstandings, irritation, and even disasters (Anestis et al., 2022; Channell et al., 1994; Gordon & Edwards, 1997). Therefore, paying attention to medical discourse's social, linguistic, and cognitive contexts is significant in medicine. However, the pragmatic study of doctor-patient interactions employing cooperative principles has not received much attention in the Jordanian context, and further studies are recommended (Lazaraton, 2002; Schegloff, 1999).

This study aims to analyze the conversational implicatures of medical discourse in the case of doctor-patient conversations. To investigate the implementation of the cooperative principles in doctor-patient discourse and the functions they serve in facilitating effective communication. The study focused on identifying the cooperative principles in doctor-patient discourse, understanding their functions, and examining how conversational implicatures are implemented in this context.

The current study on doctor-patient discourse and conversational implicatures can provide new insights into the importance of effective communication in healthcare. Examining doctor-patient discourse's cooperative principles and functions offers learners, teachers, policymakers, healthcare organizations, and language speakers/writers' valuable information about the challenges of miscommunication and adverse effects. Therefore, we aim to explore the concept of conversational implicature in DA while focusing on cooperative principles.

II. METHODOLOGY

This study is a mixed methods approach, combining qualitative and quantitative methodologies to analyze doctor-patient discourse. The quantitative method is used to quantify the frequency of collected data, whereas the qualitative method is used to analyze the doctor-patient discourse using themes. The triangulation design is used to contrast and compare results directly. This approach is robust in providing reliable, valid, and concrete findings.

A. Study Sample

The study chose twenty-six observations from doctor-patient discourse using purposive sampling, which is suitable for understanding research questions. The data was collected from two clinics in Amman, a private clinic and a government clinic. Qualitative studies typically have smaller samples than quantitative studies, and participants can be added during the process.

B. Sampling Technique

The study collects primary data by selecting a sample of twenty-six tape-recorded doctor-patient dialogues from two Amman clinics. The sampling technique used is purposive sampling, and the sample is discussed with experienced colleagues to ensure credibility. The research design is descriptive, and the researcher aims to analyze conversational implicatures in doctor-patient conversations. The reliability was achieved by avoiding bias in data collection and analysis. The objective procedures, notes, and processes describe and interpret the phenomena.

C. Thematic Analysis

Qualitative data analysis can encompass various activities and approaches, from creative speculation to structured analytical techniques. In contrast to quantitative data analysis, which relies on statistical methods to summarize data and answer research questions, qualitative data analysis seeks to identify themes and patterns within the data. For this study, the researcher has chosen to use Braun and Clarke's six-phase framework (generating initial codes, searching for themes, reviewing themes, defining themes, and writing up the findings) for thematic analysis, which involves becoming

familiar with the data, generating initial codes, searching for themes, reviewing themes, defining themes, and writing up the findings. This approach provides a structured and systematic way to analyze the data and identify key themes related to the doctor-patient discourse.

Thematic analysis is essential for its versatility and accessibility, and it can be applied in various ways, making it adaptable. The researcher has various dynamic decision-making options, including the thematic analysis type, how to interpret the results, and the rationale behind the method selection (Westcott et al., 2020).

III. RESULTS AND DISCUSSION

This study highlights Grice's cooperative principles, which describe how individuals behave in conversations, including quality, quantity, manner, and relevance. These maxims may overlap, and when a speaker willfully violates a maxim to create an implicature, this is known as flouting. Flouting can add meaning to the utterance's literal meaning, allowing the recipient to search for another meaning rather than being deceived.

This study used Grice's conversation theory to identify conversational implicatures and analyze doctor-patient dialogues.

Answers to three questions were addressed here:

- What are the cooperative principles (quantity, quality, manner, and relation maxims) in doctor-patient discourse?
- What are the functions of these cooperative principles?
- How are conversational implicatures used in doctor-patient discourse?

A. The First Research Question, "What Are the Cooperative Principles (Quantity, Quality, Manner, and Relation Maxims) Presented in the Conversational Implicatures of Doctor-Patient Discourse?"

The cooperative principle was employed through Grice's maxims to present the frequency of four maxims. The cooperative principle defines how listeners and speakers behave cooperatively and mutually accept one another to be understood in a particular way to produce effective conversational communication in everyday social contexts (Grice, 1975b). Grice's four conversational maxims—quantity, quality, relation, and manner—also known as the Gricean maxims—are separated into the cooperative principle. These four maxims outline particular rational guidelines that those who adhere to the cooperation principle and seek good communication follow (Kordić et al., 1991).

The principle describes how individuals behave in conversation despite being expressed as a prescriptive mandate. According to Jeffries and McIntyre (2010), Grice's maxims encapsulate the assumptions we prototypically hold when conversing. The presumption that the maxims will be adhered to makes it easier to read statements that, on the surface, appear to flout them; such flouting reveals silent implicatures that enhance the meaning of the statement (Jeffries & McIntyre, 2010).

We identified the expressions presented in the doctor-patient dialogue based on their frequencies of occurrence regarding quantity, quality, manner, and relation maxims. **Table 1** shows that the most frequent maxim is the manner, with a percentage of 24.1% in all situations, including doctor-patient dialogues. It is followed by quality being 3.8% and then relevant maxim with the percentage of 3.7%. Lastly, the quantity maxim is 1.3%. The findings can be logically accepted, supported by a previous study by Zhang (2015), which stated that there is a link between manner and quality. If patients present the quality maxim during their conversation, the manner maxim can be presented more (Zhang & Zhang, 2015). However, the manner maxim can be flouted if the quality maxim is flouted. On the contrary, Mandarani (2020) found that quality is the most frequent maxim in doctor-patient communication (Mandarani, 2020). In addition, Haugh (2015) also revealed that quality maxim was more frequent among other studies (Haugh, 2015).

TABLE 1
FREQUENCY OF QUANTITY, QUALITY, MANNER, AND RELATION MAXIMS

Maxims	Frequency	Percentage	Non-flouting	Percentage
Quality	80	3.8%	Cooperative	33.3%
Quantity	36	1.3%		
Manner	501	24.1%		
Relevant	76	3.7%		

B. The Second Research Question, "What Are the Functions of the Cooperative Principles (Quantity, Quality, Manner, and Relation Maxims) Used in Doctor-Patient Discourse?"

To answer this question, the researcher highlighted the function of cooperative principles. Indeed, such function can serve the idea of expressive, directive, assertive, and declarative as presented in the conversation between doctors and patients. **Table 2** shows some examples of the functions using the four maxims.

TABLE 2
FUNCTION USE OF THE MAXIMS

Expressions	Flouting/Non-flouting	Cooperative/Non-cooperative	Functions
Dr: penicillin allergy, Sullpha allergy, fish or eggs allergy, spring allergy?	flouting manner	non-cooperative	directive
Father: she has an allergy but mmmm	flouting quantity	non-cooperative	expressive
Dr: seasonal?	flouting relevant	non-cooperative	assertive
Father: no no no, the allergy is in her parts here from wool, chips, and others	flouting quantity	non-cooperative	assertive
Dr: great so it is like Eczema	flouting quantity	non-cooperative	declarative
Father: Exactly	flouting quantity	non-cooperative	assertive
Dr: do you see that she feels tired more than the kids of her age?	flouting manner	non-cooperative	directive
Father: no no	flouting quantity	non-cooperative	assertive
Dr: Shortness of breath Chest tightness while doing exercise medical term (wheezy chest)	flouting manner	non-cooperative	directive
Father: no no	flouting quantity	non-cooperative	assertive
Dr: Thank God for that	flouting relevant	non-cooperative	expressive
Father: yea Thank God	flouting relevant	non-cooperative	expressive
Dr: so tell us what is going on with our princess? What she suffers from?	flouting manner	non-cooperative	directive
Father: first, she felt pain in her eyes then a headache and she was feverish	quantity	cooperative	directive
Kid: And I cough	flouting quantity	non-cooperative	assertive
Dr: when you touched her, was there a fever?	manner	cooperative	assertive
Dr: yea now she is feverish	flouting quantity	non-cooperative	assertive
Dr: I wish you a speedy recovery dear, okay, so now we will check up and give you a very nice sticker, we want to check that everything is okay and I wish she will get well soon	flouting manner	non-cooperative	expressive
Father: are you off today from the hospital?	flouting relevant	non-cooperative	directive
Dr: yes, I am on a leave today and tomorrow	flouting quantity	non-cooperative	declarative
Father: nice	flouting quantity	non-cooperative	expressive
Dr: yes I want the leave to relax and take my wife and son and do some activities	flouting relevant	non-cooperative	expressive

Table 2 reveals that each expression has its function as it intends to recognize one of the four functions to direct someone to do something or understand something, express feelings, declare something to the listener, or assert some facts. For example, when a doctor asked, "Penicillin allergy, Sullpha allergy, fish or eggs allergy, spring allergy?" this doctor intended to direct the listener to what exactly you feel the status of the case. In addition, in this expression, the speaker asserts, "No, the allergy is in her parts here from wool, chips, and others." The doctor, declares, "Great, so it is like Eczema." The doctor can declare as they are in the position that allows them to declare something.

These functions can be presented in most expressions and can be somehow linked to the maxims as they share the same characteristics. For example, assertive to assert something true, which is directly related to the quality maxim. In addition, the directive is mostly related to the manner maxim, as the idea is to be precise and clear by directing the listener to your needs. Such links can be essential to ease the functional use of the four maxims. The findings agree with Huda (2013), who stated that the four maxims could be presented in the following function (directive, declarative, expressive, assertive, and commissive) (Huda, 2013b). It also agrees with Riyanti and Sofwan (2016), who found connections between directive, expressive, assertive, declarative, and Grice's maxims of the cooperative principles (Riyanti & Sofwan, 2016).

C. Third Research Question; "How Are the Conversational Implicatures Implemented in Doctor-Patient Discourse?"

We pinpointed the following frequencies and percentages of the maxims' used to answer this research question. **Table 3** shows that non-cooperative conversational implicatures are more frequently used in the doctor-patient dialogue. More specifically, it is shown that 66.7% of the dialogue nature follows the non-cooperative implicature by flouting Grice's maxims. The highest frequency is for flouting quantity maxims, with a percentage of 41.9%. This can be due to the nature of discourse, as medical discourse may need more explanation or shortened answers to direct the listeners to the point, as seen in **Table 4**.

TABLE 3
CONVERSATIONAL IMPLICATURES IMPLEMENTED IN DOCTOR-PATIENT DISCOURSE

Maxims	Frequency	Percentage	Non-flouting	Percentage
Quality	80	3.80%	Non-cooperative	66.7%
Flouting Quality	51	2.5%	Cooperative	33.3%
Quantity	36	1.30%		
Flouting Quantity	871	41.9%		
Manner	501	24.10%		
Flouting Manner	237	11.50%		
Relevant	76	3.70%		
Flouting Relevant	232	11.20%		
Total	2084			

TABLE 4
FLOUTING QUANTITY MAXIMS

Dialogue	Maxims	Flouting/non-flouting
Dr: do you have pain in your tonsils?	manner	cooperative
P: yes	Flouting quantity	non-cooperative
P: he said I have a lot of pus discharge and thus I have Tonsil's enlargement	Flouting quantity	non-cooperative
Dr: mmmm	Flouting quantity	non-cooperative
P: yea it came back but after that....	Flouting quantity	non-cooperative
Dr: after that you took a treatment needle?	Flouting quantity	non-cooperative
P: he gave me two	Flouting quantity	non-cooperative
Dr: great, Samixon green	manner	cooperative
P: yes	Flouting quantity	non-cooperative
Dr: okay great	Flouting quantity	non-cooperative

In addition, 24.10% of the dialogues follow the manner maxim because doctors need to ask direct and precise questions to the patients, as shown in **Tables 3, 5, and 6.**

TABLE 5
MANNER MAXIMS

Dialogue	Maxims	Flouting/non-flouting
Dr: Did the Dr give him any medications?	manner	cooperative
Dr: Okay, great, antibiotic, anti-inflammatory,	manner	cooperative
Dr: and did he ask for this x-ray?	manner	cooperative
Dr: he is number one, number two: if we look backward to the vertebrae of the spine which is clearer in this picture	manner	cooperative
Dr: we see Calcareous changes because of what? Age.	manner	non-cooperative
Dr: this is a consequence; we need to know about the existing Calcareous	manner	cooperative
Dr: okay, other than that, the heart muscle is good for a patient who did an open-heart surgery	manner	cooperative
Dr: Okay so also there are no liquids in the lungs and thank God in both lungs	manner	cooperative
Dr: in addition, there is an increase in the blood flow to the extremities, we call it: Bronchitis	manner	cooperative
Dr: also the muscle's size is good and there are no liquids in the lungs	manner	cooperative

TABLE 6
FLOUTING MANNER MAXIMS

Dialogue	Maxims	Flouting/non-flouting
Dr: I wish you a speedy recovery, tell me, what is your name?	flouting manner	non-cooperative
Dr: yea, no worries, leave your father away; you made him mad hhhhh. I wish you a speedy recovery. All is good, dear?	flouting manner	non-cooperative
Dr: oh I wish you a speedy recovery. I thought it is our little princess	flouting manner	non-cooperative
Dr: allergic to any medications, no right? Gynecological problems / polycystic ovary syndrome? They went away and the menstrual cycle is back and you stopped taking the medications?	flouting manner	non-cooperative
Dr: Thank God, diabetes or blood pressure?	flouting manner	non-cooperative
Dr: this for normal people but you are an athlete and you do not have fat man hhhh	flouting manner	non-cooperative
Dr: okay it dissolves but the most important thing is that the cumulative remains under seven	flouting manner	non-cooperative

Further, it shows that 11.50% of the expression follow flouting manner maxims as Zhang (2015) states that flouting manner can appear in doctor-patient dialogues more frequently when speakers are not being clear or brief during the conversation (Zhang & Zhang, 2015). It also illustrates that 11.20% of dialogue follows the flouting relevant maxim in **Table 3.** This can be observed in the doctor-patient conversation shown in **Table 7.**

TABLE 7
FLOUTING RELEVANT MAXIM

Dialogue	Maxims	Flouting/non-flouting
Dr: any vaginal secretions?		
P: Yesterday I did the tests you told me about	flouting relevant	non-cooperative
Dr: we will check them, give them to me. Let me see		
Dr: okay, so madame, so the situation is that because you are now in the ninth month, you should walk one hour a day to check that the baby is in the pelvis; other than the one-hour walking, you should use the Papaya pills that can help to expand the uterus, and you should eat Pineapple every day in addition to dates every day also, and Squat exercises, do you know what is that?	flouting relevant	non-cooperative
P: yes, I do		
Dr: okay, and you should walk for a whole one hour, every day the uterus will become soft and this will help the uterus expansion, it will not be like that instantly but when the cervix becomes thin, it helps to expand, now we will see your tests and inshallah all will be good and then we will check you, your blood type is AB+, great, this blood type is already common	flouting relevant	non-cooperative
Dr: I wish you a speedy recovery, any burning or acidity at the top of the stomach?		
P: yes, this is because of the pregnancy	flouting relevant	non-cooperative

Moreover, the other maxims have fewer frequencies, as shown in **Table 3**. More specifically, 3.8% of the conversations followed the quality maxim, and 3.7% followed the relevant maxim. It is also shown in the same table that the lowest frequency was for flouting quality and quantity maxim being as follows: 2.5% for flouting quality and 1.3% for quantity.

In the twenty-six doctor-patient oral interactions, doctors and patients obey the non-cooperative principles most of the time, occupying nearly 66.7% of the time on average and 33.3% for cooperative implicature. In the four types of conversation, twenty-six conversations for diagnosis were collected. The analysis was carried out based on different types of doctor-patient oral interaction. It is found that a complete doctor-patient oral interaction in the outpatient department can be generally divided into four functions: directing, expressing, declaring, and asserting. The doctor-patient conversation should be a focus of researchers paying attention to the whole context of a conversation to provide the implied meaning. Since using the relevance maxim seems to hide some meaning, readers may not be able to understand the context. In addition, the pragmatics theory of Grice could help understand the context of conversations.

IV. CONCLUSION

In conclusion, this study focused on using cooperative principles, specifically the maxims of quantity, quality, manner, and relation, in doctor-patient discourse and their relation to conversational implicatures. The findings indicate that understanding the function of such maxims is crucial for comprehending the implicated meanings of conversational implicatures. The shift of the addressee is also a significant factor in the interpretation of conversational implicatures, and listeners must pay attention to it. This study emphasizes the need to understand the function of these maxims and the role of interpreters in facilitating comprehension.

V. FUTURE RECOMMENDATIONS

This study utilized the Grice theory to facilitate the identification of the implications of the utterances in doctor-patient discourse. However, other theories, such as the theory of Gan Sperber and Deirdre Wilson, could also be employed to further assess the implications of the utterances. This approach may lead to discoveries that were previously unknown. Therefore, we recommend further investigating target text modification, potentially utilizing other theories to enhance understanding of the implications of utterances in doctor-patient discourse. By incorporating multiple theories, researchers may gain a more comprehensive understanding of the communicative strategies employed in such interactions, ultimately leading to a deeper understanding of language use in medical settings.

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