Categorizing and quantifying doctor’s extended answers and their strategies in medical teleconsultations

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Abstract
This study analyzed 210 clinical teleconsultations using corpus software to categorize and quantify doctors’ extended answers and communication strategies. The findings reveal that doctors’ extended answers could be classified into seven categories, with explanations for the inability to provide accurate diagnoses having the highest frequencies at 40.6%, followed by justifications for diagnoses at 30.9%. The remaining categories had lower frequencies ranging from 3.2% to 8.3%. Brown & Levinson's communication strategy framework was employed to categorize strategies used in extended answers. Four strategies were identified: baldly on-record strategy (BORS), positive politeness strategy (PPS), negative politeness strategy (NPS), and off-record strategy (ORS). Among these, NPSs were the most commonly used at 83.4%, followed by BORSs at 9.2% and PPSs at 6.4%. ORS were the least utilized at 1.0%. Within the seven NPS categories, making vague diagnoses had the highest percentage at 36.2%, followed by providing justifications or explanations for diagnoses at 26.3%. Other NPS categories had proportion ranging from 13.5% to 0.2%. The frequencies of the two BORS categories each accounted for 4.6%. The dominant proportion in PPS was being optimistic at 3.6%, while the other two categories of using in-group markers and employing consolation routines accounted for 1.2% and 1.5%, respectively.

Introduction
Before the patient-centered clinical model was introduced by Stewart et al. (1995), research had focused on doctors’ communication techniques with patients and the organization of such techniques (Byrne & Long 1976, Mishler 1984, Ley 1988, Cohen-Cole 1991, and Roter & Hall 1992). However, since the emergence of this new model as a standard clinical method, increased attention has been given to the patient’s discourse in medical interviews. One specific area of interest has been the examination of patients’ extended answers during face-to-face medical consultations or interviews and their interpersonal significance (Peräkylä 2006, Stivers & Heritage 2001). While research in this area is relatively developed, studies on doctors’ extended answers in medical teleconsultations are still in their early stages. In exploring doctor-patient communication strategies during consultations, some researchers have sought to categorized patients’ strategies based on Brown & Levinson’s (1987) Face Theory. However, limited attention has been given to doctors’ strategies in face-to-face consultations, and even less in teleconsultations. Therefore, the objective of this paper is to classify and quantify doctors’ extended answers and the strategies employed in these answers during clinical teleinterviews.

Literature Review
2.1 Extended answers in the clinical consultations

Before diving into the literature review, it is crucial to introduce the concept of adjacency pairs. Schegloff & Sacks (1973) posit that conversations are composed of closely related turns known as adjacency pairs, such as question-answer, greeting-greeting, offering-accepting or refusing. The second speaker can often provide a minimal response, like a simple yes or no, to an interrogative question, or accept or refuse
an offer without elaborate commentary. In cases where expected response can be provided for a question, the answer may be (i) the only required information, or (ii) more is offered than what is expected, while in cases where expected response cannot be provided, the answer may range from (iii) a simple “I don't know” to providing additional information (iv) with or (v) without explanation (Yu & Guo 2020). Wang & Yu (2021) define the case (ii) where more information than required is provided as the extended response. Peräkylä (2006) observed in clinical consultations that patients of Finnish origin might offer more information than expected, particularly when doctors hesitate to make a diagnosis or when the diagnosis falls short of patient’s expectations. Peräkylä labels this additional information as the extended response, a concept that differs from Wang & Yu’s definition.

Researchers have attempted to categorize patients’ extended answers based on face-to-face clinical consultations. Stivers & Heritage (2001) identify three categories: addressing difficulties in responding, supporting answers by adding details, and preempting negative inference. Wang & Yu (2001) propose four categories: presenting prior medical treatment effectiveness, supporting answers by adding details, providing diagnosis-related information, and addressing difficulties in responding. Wang & Yu’s categories are somewhat similar to Stivers & Heritage's.

While there is a wealth of literature on doctors’ discourse in clinical consultations (e.g., Neighbour 1987, Ley 1988, and Cohen-Cole 1991), patient-centered care models (e.g., Brown, Weston & Stewart 1989, Mcwhinney 1989, and Stewart et al. 1995), and principles doctors should follow in these models, specifically the optimization principle and the recipient design principle (see Maynard 2003 and Boyd & Heritage 2006), limited information exists on categorizing doctors’ extended answers in medical interviews. This study aims to classify doctors’ extended answers and present the frequency of each category based on a corpus of clinical teleconsultations.

2.2 Communication strategies in extended answers

The exploration of strategies used by patients and doctors in clinical interviews has been a key focus in the study of patient-doctor interactions (Zhang & He 2021). Previous research within the Chinese context has utilized Brown & Levinson’s (hereafter abbreviated as B & L) Face Theory framework, which includes baldly on-record strategy (BORS), positive politeness strategy (PPS), negative politeness strategy (NPS), off-record strategy (ORS) and opting out strategy (OOS). Liu & Liu (2011) conducted a study based on outpatient consultations and identified fourteen categories of doctor strategies, including eight PPS categories, five NPS categories and one ORS category. Long, Wu & Wang (2012) studied inpatient consultations in the Internal Medicine department of and found that doctors primarily employed PPSs and NPSs, with multiple categories under each. Hu (2016) analyzed consultations in the outpatient service, revealing the strategies used by both patients and doctors. Patients predominantly utilized PPS, NPS and ORS, with multiple categories under PPS and ORS, while doctors employed BORS, PPS, NPS and ORS, with multiple categories under each.

These studies demonstrate both similarities and differences in strategy usage. While PPS and NPS are consistently found to be among the more frequently used strategies, there is variability in the findings. Liu
& Liu found doctors favored PPS, whereas Long et al. and Hu observed a preference for NPS. Hu’s study also highlighted a significant difference in the distribution of strategies, with NPS being employed more frequently than PPS.

Given the discrepancies in findings regarding the strategies used by doctors in clinical consultations, particularly in the context of extended answers during medical consultations, this study seeks to analyze and explore the distribution of these strategies further. By examining strategies employed by doctors in their extended answers, insights can be gained into the communication dynamics in medical teleconsultations.

**Research Design**

3.1 Research questions

The first research question focuses on the categories of doctors’ extended answers in clinical teleconsultations and the distribution of these categories. An extended answer in this context refers to a response that goes beyond providing minimal information in relation to patients’ direct questions for diseases and treatments, as well as doctors’ answers in making a diagnosis (Wang & Yu 2021).

The second research question explores the categories of strategies used in these extended answers, and the extent to which each strategy is employed. Communication strategies, as defined by B & L (1987), encompass five categories that are utilized in various ways during the course of a teleconsultation.

By examining these two research questions, we aim to gain a deeper understanding of the communication dynamics and patterns observed in clinical teleconsultations, particularly in terms of the types of responses given by doctors and the strategies employed in their interactions with patients.

3.2 Research method

In this study, data analysis is conducted using discourse analysis and corpus linguistic method. Discourse analysis aids in extracting doctors’ extended answers by examining concepts such as adjacency pairs, minimal responses and turn-taking in clinical teleconsultations. This method allows for a detailed analysis of the interaction patterns between doctors and patients.

The corpus linguistic method involves notating the corpus of data and utilizing concordance software to search for specific keywords or phrases related to extended answers and communication strategies. By leveraging this method, researchers can quantify the frequency of extended answers and communication strategies used by doctors in teleconsultations. This quantitative approach provides valuable insights into the prevalence and distribution of these communication patterns within the data set.

3.3 Corpus collection
The corpus used for this study is primarily sourced from the clinical platform *Spring Rain Doctors* (www.chunyuyisheng.com), with additional data collected from the platform *Good Doctors Online* (www.haodf.com). The aim is to create a comprehensive corpus, but due to insufficient data from *Spring Rain Doctors*, samples are also obtained from other clinical platforms, with a focus on *Good Doctors Online* being another target source. Both platforms permit the free download of medical interviews, and the samples are randomly selected for analysis.

The interviews included in the corpus are sourced from six clinical departments: paediatrics, orthopaedics, oral and maxillofacial surgery, ophthalmology, otolaryngology, and oncology. A total of 177 doctors interacting with various patients in 210 interviews included in the corpus. The data covers a period of five years, from 2018 to 2022, with varying numbers of interviews extracted from each year (10 from 2018, 41 from 2019, 94 from 2020, 9 from 2021, and 56 from 2022). The total size of the corpus is 170,000 Chinese characters.

The interviews are evenly distributed across the six departments, with 35 interviews from each department. Of these, 30 interviews are sourced from *Spring Rain Doctors* and 5 from *Good Doctors Online*. This diverse corpus provides a rich data set for the analysis of communication patterns and strategies in teleconsultations across different medical specialties.

3.4 Data analysis

First, the original corpus will be proofread to correct spelling errors and eliminate repetitive content. Second, criteria for extended answers will be established. Next, criteria will be established for extended answers in the analysis. Specifically, extended answers refer to doctors’ responding directly to patients’ questions for diseases and treatments. Indirect questions and those not pertaining to diseases or treatments will not be considered in this study. Additionally, the background questions posed at the beginning of interviews and questions repeated without responses from previous queries are excluded from patients’ questions. Furthermore, patients’ turns consisting solely a question mark will not be counted as questions.

For example, consider the following excerpts (translated into English):

Excerpt 1: (From Conversation 100)

P: The ulcer at the tip of my tongue has improved, but I’m wondering *why it still hurts after so long.*

Excerpt 2: (From Conversation 41)

(My right knee has been hurting for two months, and got occasional pain in the sole of the foot. *What should I do with it?*(16/11/2020))

D: Please upload to me the previous diagnostic result.

P: I have no idea where to put it.
P: ?

...

P: Hello. Are you still online?

Excerpt 3: (From Conversation 97)

(The patient uploaded the previous diagnostic results and they cannot be displayed for privacy reasons.)

P: What’s wrong with this?

...

D: Sorry to keep you waiting. I had a consultation just now.

P: It’s OK. *What’s wrong with this?*

Based on the criteria outlined above, the italicized segments in these excerpts are not considered questions in this study. It was found that patients asked 1280 questions related to diseases and treatments, with 140 remaining unanswered[1]. In 8 interviews, patients did not ask any questions meeting the specified criteria.

Certain types of information will not be considered as extended answers, including: *(i)* doctors inquiring about patients’ treatment history, *(ii)* doctors’ responses consisting solely of non-linguistic signs such as question marks or smiling faces (), *(iii)* information not directly related to the questions asked, and *(iv)* information that is difficult to determine its relevance to the questions. The assessment of extended answers is primarily based on turns in the conversation. In instances where a turn includes multiple sentences, there may be more than one extended answer of the same type. Consider the following examples:

Excerpt 4: (From Conversation 31)

...

(1)P: How many anti-inflammatory drugs does he need to take?

(2)D: Only one. *Is he allergic to cephalosporins?* Take Amoxicillin clavulanate potassium.

(3)D: It’s the medicine of the Qingmycin type, which he is not allergic to.

...

(4)P: Can you prescribe some granules? ...

...
(5) D: OK, no problem.

(6) D: Take more drinking water. If the throat is sore, use Houjian Spray.

(7) P: Should he continue to take this?

(8) D: It’s OK to continue pullulan and fluconazole.

(9) D: The latter is sufficient for treating cough.

(10) D: There is no need to take Qingfei granules.

Excerpt 5: (From Conversation 32)

P: Should I continue feed him diarrhea milk?

D: Feed him normal milk gradually.

D: It is impossible to always feed diarrhea milk ( ).

Excerpt 6: (From Conversation 17)

P: Should we go to hospital for a blood test tomorrow, or just stay home to observe two days?

D: You’d better go for a blood test. That done, we (“zan”) will know what the problem is. If it is inconvenient to have a blood test, you can observe for two days. But your child must be in normal condition. If not, seek the medical attention at any time.

In these excerpts, the underlined segments represent extended answers to the relevant questions, while the italicized parts do not qualify as extended answers according the specified criteria. Turn (6) in Excerpt 4 is not considered an extended answer to the question in turn (4) as it is unrelated to medicine prescription. The last turn in Excerpt 4 is excluded from extended answers due to ambiguity regarding its relevance to Qingfei Granules in turn (7).

Excerpt 5 also illustrate a non-linguistic response from the doctor, which is not counted as an extended answer. Excerpt 6 demonstrates two extended answers categorized under providing a basis for determining diseases and treatments.
In some instances, a single utterance can fall under multiple categories of extended answers. For example, in Excerpt 7, the underlined part in turn (4) corresponds to category three (giving soothing words and/or apology for not timely interview or not accurate diagnoses) and seven (providing a basis for determining diseases or treatments).

Applying the criteria outlined here, 433 extended answers are identified from 155 medical interviews. The remaining 55 interviews did not include any extended answers, with 8 lacking patients' questions related to diseases or treatments.

Excerpt 7: (From Conversation 151)

(1) P: I have already bought Oulongma Drops. Do I need any ointment or massage for him?

(2) D: No need to do these.

(3) P: OK. Is there anything else to pay attention to?

(4) D: The treatment for adenoid hypertrophy is effective because he is only three years old. No, nothing else.

In terms of classifying extended answers, I initially attempted to utilize frameworks proposed by Stivers & Heritage's (2001) and Wang & Yu's (2021). However, as the analysis progressed, it became apparent that these frameworks are not suitable for the corpus at hand. Subsequently, a new categorization system was developed, and the notation was reset. The extended answers were segmented into four overarching groups, encompassing a total of seven categories within them. Each category was designated as [EAx], with “x” signifying a specific category.

Regarding communication strategies found in extended answers, I delved into B & L's Face Theory to grasp the essence of each category, especially those within PPS and NPS. Drawing on classifications from Liu & Liu (2011), Long et al. (2012), and Hu (2016), a refined framework for categorization emerged throughout the corpus analysis. This framework evolved into a four-strategy system, namely: BORS, PPS, NPS, and ORS. Within this system, there were two categories of BORS, three of PPS, seven of NPS, and one of ORS, denoted as [BORx], [PPx], [NPx] or [NPx(y)], and [OR], respectively.

The identification of strategies is primarily based on turns, with each unit of strategy typically corresponding to a single sentence within an extended answer. However, if a turn contained multiple sentences, it could encompass two or more categories of strategy. At times, a single sentence could incorporate more than one strategy category, exemplified in Excerpt 6 where multiple strategies coexisted within the text, specifically, category one of PPS (employing the in-group marker ‘zan’ (equivalent to ‘let’s’ in English)) and category six of NPS (providing justifications for treatments) in the first underlined part, and category five of NPS (making vague diagnoses) in the second underlined part, with “but...” and “if...” representing concession in diagnoses making and conditional diagnoses respectively.
Following the criteria outlined in this research, a total of 586 strategies were identified across all the extended answers, comprising 54 of BORS, 37 of PPS, 489 of NPS, and 6 of ORS. The notated corpus was then transferred into a text file (xxx.text) and imported into the BFSU Powerconc 1.0 corpus software, facilitating further analysis of Chinese corpus. Figure 1 presents a snapshot of the search results obtained through this software.

[1] The unanswered questions are defined to be: (i) doctors not answering questions at all, and (ii) the information provided not related to questions.

**Doctor’s extended response: categories and frequency**

The seven categories of extended answers are shown in Table 1.

<table>
<thead>
<tr>
<th>Category definition</th>
<th>Example</th>
<th>Freq./%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Daily precautions and their justifications</td>
<td>D: ... <em>Keep his hand clean.</em> (conv. 5)</td>
<td>36/8.3</td>
</tr>
<tr>
<td>2: Non-medical treatments and their justifications</td>
<td>D: ... <em>Do more exercises and take more sunbath.</em> (conv. 34)</td>
<td>33/7.6</td>
</tr>
<tr>
<td>3: Soothing words or apology</td>
<td>D: ... <em>It is no problem for it.</em> (conv. 16)</td>
<td>14/3.2</td>
</tr>
<tr>
<td>4: Non-medication resources</td>
<td>D: ... <em>General anesthesia usually costs over 5000 yuan.</em> (conv. 92)</td>
<td>17/3.9</td>
</tr>
<tr>
<td>5: Diseases, difficulties in making their diagnoses</td>
<td>D: ... <em>It is similar to glaucoma symptoms like aches in the eyes and head.</em> (conv. 137)</td>
<td>23/5.3</td>
</tr>
<tr>
<td>6: Treatments, difficulties in making their diagnoses</td>
<td>D: ... <em>It may affect the effectiveness of the vaccine at most.</em> (conv. 2)</td>
<td>134/30.9</td>
</tr>
<tr>
<td>7: Conditions for determining diseases and/or treatments</td>
<td>D: <em>You may feed him cold and cough medicine. I'm not sure if he has bronchitis yet.</em> (conv. 12)</td>
<td>176/40.6</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td>433/100.0</td>
</tr>
</tbody>
</table>

These seven categories can be included into two general groups. The first four categories pertain to non-medical treatment suggestions, covering daily precautions, non-medical treatments, soothing words, and non-medication resources. The category of daily precautions includes restrictions of diets (e.g. keeping light diets, and consuming more warm water), footwear choices (e.g. not wearing high heels), the use of certain household items (e.g. fluoride-free toothpaste), and certain lifestyle habits (e.g., not watching TV while eating, and not staying up late). Non-medical treatments category consist of treatments like
inhalation of oxygen and nebulized water, warm or cool water compress, massage, exercises (e.g. calisthenics, yoga), mechanical traction therapy, and the use of assistive devices such as walkers, protective gears and (near- or far-sighted) glasses. The description of medication effectiveness and side effects are also included in this category. Soothing words are such words as “Don't worry”, “It's all right”, “Don't be sensitive”. This category also consists of apologizing for the inability to make an accurate diagnosis. Non-medication resources comprise information like hospitals and experts specializing in the treatment of certain diseases, treatment expenses (including time and money costs), and the formation of organs or tissues and/or their functions.

The second general group pertains to medical treatment proposals, encompassing diagnosing diseases and symptoms, treatments, and providing conditions for determining diseases and treatments. In diagnosing diseases and their symptoms, a doctor may explain difficulties in diagnosing a disease if the patient does not provide specific information about the symptoms or medical history. The category of diseases and symptoms diagnoses also includes determining the severity of a disease and its progression. The treatments category encompasses examinations (e.g. the test of blood, tissues, body fluids, eyesight, blood pressure which are assisted by equipment, and the observation of one's complexion and posture, taking one's pulse and hand pressing the body part without assistance of equipment), medication (e.g. Western, Chinese and medicated plaster), treatment procedures of surgery and recovery, and the effectiveness of medication (including the side effect). This category also pertains to doctors’ explanations of difficulties in determining treatments. A large number of doctor provide conditions for the determining diseases and treatments. Therefore, they are put into one separate category.

Table 1 displays the frequencies and the percentages of each category. It reveals that doctors are more likely to offer information related to medical treatments, with categories six and seven being the most prevalent at 30.9% and 40.6% respectively. Each of remaining categories are employed far less frequently than category six or seven. Categories one and two hold similar frequencies, at 8.3% and 7.6% respectively. Category five, focusing on disease information and diagnostic challenges, has a frequency percentage of 5.3%. The frequencies of categories three and four are the lowest, at 3.2% and 3.9% respectively.

The dominant frequencies of categories six and seven align with common diagnostic practices. During clinical interview, doctors often go beyond expected diagnoses by providing additional information on treatment options and disease determination. The lower frequency of categories one and two may be linked to the corpus’s nature, predominantly originating from departments specializing in certain areas. The limited frequency of category five can be attributed to the challenge of remote consultations. The extremely low frequencies of categories three and four suggest that doctors may prioritize providing accurate medical advice due to constraints in teleconsultations.

In conclusion, doctors need to prioritize offering precise medical guidance during teleconsultations to ensure optimal patient care, especially given the limitations of remote interactions.
Strategies in the extended answers: classes and frequency

Four communication strategies have been identified in the corpus: BORS, PPS, NPS and ORS. With the exception of ORS, these strategies encompass multiple categories. Table 2 displays categories of PPS, BORS, and ORS, along with their corresponding examples and frequencies.

Table 2  Categories, examples and frequencies of PPS, BORS, and ORS

<table>
<thead>
<tr>
<th>Category definition</th>
<th>Example</th>
<th>Freq./%</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPS1:Using in-group markers</td>
<td>D:... If it really can't be solved, let's ('zan') meet then. (conv. 206)</td>
<td>7/1.2</td>
</tr>
<tr>
<td>PPS2:Employing consolation routines</td>
<td>D:... There's no problem for it. (conv. 16)</td>
<td>9/1.5</td>
</tr>
<tr>
<td>PPS3:Being optimistic</td>
<td>D:... it's quite effective. (conv. 24)</td>
<td>21/3.6</td>
</tr>
<tr>
<td>BORS1:Directly requesting patients to accept specific treatments</td>
<td>D: Go to see a doctor regularly. (conv. 29)</td>
<td>27/4.6</td>
</tr>
<tr>
<td>BORS2:Directly requesting patients to accept rehabilitation proposals or precautions</td>
<td>D: Don't be picky about food. Do more exercises and take more sunbath. (conv. 34)</td>
<td>27/4.6</td>
</tr>
<tr>
<td>ORS:Implicitly reminding patients to accept treatments and/or examinations</td>
<td>D: The two (drugs) are too expensive (in the drug stores), and it's much cheaper to buy them in the hospital. (conv. 105)</td>
<td>6/1.0</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td>97/16.6</td>
</tr>
</tbody>
</table>

Note: The percentages after the slash “/” in Tables 2 and 3 indicate the frequency of a category divided by the total frequency in the tables (586 in total), multiplied by 100.

In-group markers in category one of PPS include expressions like “let's” (“zan”, “zanmen”), “baby” (referring to a child in Mandarin Chinese, “baobao” in pinyin), “dear” (“qin”), “grandma” (“nainai”) and similar terms. Consolation routines in category two of PPS consist of expressions such as “Don't worry”, “Don't be (so) worried”, “It's all right”, “Don't be (too) sensitive (about it)“. Being optimistic in the third category of PPS involves providing positive evaluations of treatment and medication, praising the quality of medical institutions, or emphasizing the trustworthiness of doctors or medical teams.

BORS and ORS are derived from B & L's (1987) concept of politeness strategies. BORS focuses on propositional content of the message without considering any mitigating redress, while ORS involves concealing a face threatening act (FTA) and relies on co-textual information for the hearer to grasp the underlined meaning. The treatments in the first category of BORS include examinations, medication
and/or surgeries, with examinations encompassing both equipment-assisted and non-equipment-assisted procedures. Precautions in the second category of BORS refer to measures beneficial for disease rehabilitation, such as dietary restrictions (e.g., light diet, and drinking more warm water), appropriate footwear choices (e.g., avoiding high-heels), using specific daily household items (e.g., fluoride-free toothpaste), and adopting healthy lifestyle habits (e.g., not watching TV while eating, avoiding late nights). ORS involves subtle reminding patients about specific treatments, including examinations, medications and surgeries, without directly mentioning them.

The categories of NPS, along with their corresponding examples and frequencies are displayed in Table 3.

Table 3  Categories, examples and frequencies of NPS
<table>
<thead>
<tr>
<th>Category definition</th>
<th>Example</th>
<th>freq./%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Apologizing and its reasons</td>
<td>D: Sorry, (I can’t offer you the phone number (of Henan People’s Hospital)). (conv. 124)</td>
<td>1/0.2</td>
</tr>
<tr>
<td>2: Using deference in an imposition.</td>
<td>D: You (Nin) can search the phone number in the Internet by yourself. (conv. 124)</td>
<td>8/1.4</td>
</tr>
<tr>
<td>3: Stating a diagnosis as customary treatment practice</td>
<td>D: It’s characteristic of patients with adenoid hypertrophy to snore during sleep. (conv. 27)</td>
<td>6/1.0</td>
</tr>
<tr>
<td>4: Minimizing imposition while recommending treatments</td>
<td></td>
<td>79/13.5</td>
</tr>
<tr>
<td>(1) Offering one an option to make one’s own decision</td>
<td>D: It’s up to you to decide (whether to accept the treatment). (conv. 156)</td>
<td>1</td>
</tr>
<tr>
<td>(2) Making a diagnosis by personal advice</td>
<td>D: I advise you to go to see a doctor of obstetrics and gynecology department. (conv. 83)</td>
<td>20</td>
</tr>
<tr>
<td>(3) Using a mitigating expression</td>
<td>D: Try your best not to eat spicy food. (conv. 94)</td>
<td>58</td>
</tr>
<tr>
<td>5: Making a vague diagnosis</td>
<td></td>
<td>212/36.2</td>
</tr>
<tr>
<td>(1) Using a hedge</td>
<td>D: Generally it doesn’t matter. (conv. 39)</td>
<td>91</td>
</tr>
<tr>
<td>(2) Using a guess, disjunctive or concessive expression</td>
<td>D: It is estimated to be OK in about ten days. (conv. 100)</td>
<td>53</td>
</tr>
<tr>
<td>(3) Using a conditional clause</td>
<td>D: If not, seek the medical attention at any time. (conv. 17)</td>
<td>68</td>
</tr>
<tr>
<td>6: Providing justifications or explanations for a diagnosis</td>
<td>D: Don’t let him take yogurt at the moment because he is having diarrhea. ... (conv. 5)</td>
<td>154/26.3</td>
</tr>
<tr>
<td>7: Articulating reasons for inconclusive diagnoses</td>
<td>D: It is hard to decide at what age children will not suffer from bronchitis because their constitutions are different. (conv. 29)</td>
<td>29/4.9</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td>489/83.4</td>
</tr>
</tbody>
</table>

Categories of NPS can be divided into two groups: providing redresses for impositions and giving justifications for impositions. The former includes categories one to five, and the latter categories six and seven. The apologies in category one are made for not answering patients on time or not being able to make an accurate diagnosis. The expressions used include “I apologize” (”daoqian” or “baoqian”), “I’m sorry” (”duibuqi”), “Excuse me” (”buhaoqian”). However, not all instances of apologizing expressions in the corpus convey an actual apology. For example, in conversation 170, “Excuse me” is used with a denial
meaning, and in conversations 180 and 196, “I’m sorry” is used to indicate refusal. Therefore, these cases are not treated as apologies defined in this research.

Deference in category two refers to the use of the honorific term “nin”. However, it is essential to note that if “nin” is employed in a greeting or consolation routine, such as “Don’t worry” (“Nin fangxin”), it is not counted as a deference in this category. Diagnoses in category three includes those of a disease, treatment and medication.

The first subcategory of category four involves sentence patterns such as “It’s up to you …” (“You nin/ni jueding”), “You can ask your family members to see whether …” (“He nin/ni jiaren shangliang kan yaobuyao …”). The second subcategory involves personal advice, which is attached to sentence patterns like “I (don’t) suggest/advise …” (“(bu) jianyi …”), “I think/Honestly (speaking) …” (“Wo renwei/Laoshi shuo …”). The mitigating expressions in the third subcategory include verb phrases like “try one’s best” (“jinliang”), “had better” (“zuihao”), and “ought to” (“keyi/yinggai”), as well as reduplicated verbs like “kankan”, “shishi” and similar terms. For example, in the sentences “Take some antibiotics” (“Chi dian xiaoyanyao kankan”) and “You can try an intravenous injection” (“Da ge diandi shishi”). Sentence-ending particles like “ba”, “o”, “ne” also fall into this subcategory.

In category five, a hedge is an adaptor or rounder. Adaptors includes expressions like “some”, “a few”, “more or less”, “a little bit” (represented in such Mandarin Chinese as “yixia/xia”, “yidian/dian”), “sort/kind of” (“youdianr”), while rounders encompass expressions like “about”, “around”, “most”, and “roughly” (“dagai”, and “duduoshu”). The second subcategory involves guesses, expressed through phrases or sentence patterns like “I guess/estimate …” (“Wo huaiyi/guji …”), “it should be/is considered to be…” (“Yinggai/kaolv …”), and “I don’t rule out…” (“bu paichu …”). Disjunctive expressions, referring to sentence patterns like “Either… or …” (“Yaome … yaome…”, “… huozhe…”), and concessive clauses or implicit concessions also fall under this subcategory. Conditional clauses in the third subcategory are the expressions like “If…”, “… on the condition that …”, “… in case that…”, with their Mandarin Chinese equivalents being “Ruguo…”, “Zhiyao…” and “Yaoshi…”.

Category six refers to the medical justications given for examinations, treatments, and medication as well. In category seven when a doctor tries to explain the difficulty of making a diagnosis, they may use an imposition minimizing expression. This strategy is counted as category four.

The distribution of these strategy categories is presented in the last column of Table 2, and 3. Overall, NPSs are the most frequently used strategies, accounting for 83.4% of the instances. PPSs, BORSs and ORSs in total account for the remaining 16.6, with BORSs having 9.2%, PPSs 6.3%, and ORSs only 1.0%. Such distribution aligns with out intuition about diagnostic activities, as doctors have to impose certain treatments on patients. Consequently, they often employ various redresses like apologies, hedges, deference and so on to mitigate the potential FTAs, or provide reasons for doing so.

In PPS, category three (being optimistic when discussing aspects related to diseases and their treatments) accounts for 3.6%, more than half of the total frequency of PPS (6.3%). This indicates that
when trying to meet patients face wants of being respected during medical interviews, more doctors are attentive to provide comfort. The remaining categories of PPS are rarely used, each accounting for no more than 3.0%, particularly category one (Using in-group markers), which has a proportion only at 1.2%. The frequencies of the two categories in BORS each account for 4.6%. ORS is the least used, only having 1.0%, suggesting that participants, such as doctors in this research, rarely employ highly implicit strategies because there is usually no need to hide their intentions when making diagnoses.

In the realm of NPS categories, it is noteworthy that class ve (making vague diagnoses) stands out as the most commonly employed, representing a substantial 36.2% of all cases. This high frequency could potentially be attributed to the constraints inherent in teleconsultations, which often necessitate the use of imprecise phrases like “possibly”, “roughly”, “Either... or...”, and “If...” due to the lack of face-to-face interaction for comprehensive assessments. Following second is class six (Providing justifications or elucidations for diagnoses), accounting for 26.3% of instances. This trend aligns with conventional practice, where physicians back their diagnoses with sound justifications to bolster their credibility.

Falling behind in frequency is class four (minimizing imposition while recommending treatments), registering 13.5%. This low occurrence implies that some doctors take measures to reduce FTAs by granting patients autonomy in decision-making, offering personalized advice during treatments, and using soft language to suggest treatment options.

Category seven (articulating reasons for inconclusive diagnoses) holds the fourth position, representing 4.9%. The restrictions of teleconsultations may hinder doctors from reaching definitive diagnoses, prompting them to furnish patients with explanations in such cases.

Conversely, categories one through three—comprising apologies, deference, and customary treatment practice—exhibit notably meager frequencies, each contributing to less than 2.0% of instances. This discrepancy suggests that the majority of doctors refrain from issuing apologies to patients despite the challenge of accurate diagnoses in remote consultations, refraining from prescribing specific treatment modalities as standard protocol within the medical community, and showing limited inclination towards employing deferential language in their extended answers regarding diseases and treatments.

Discussions

As we rely solely on the corpus in categorizing doctors’ extended answers, we face challenges. To highlight a few, initially, category one is defined as the information about daily precautions. However, as continuing our analysis, we discover that some doctors provide justifications for these precautions. Consequently, we extend the category to include this additional information. Another challenge arises when determining whether to group plastering under category two (non-medical treatment information and/or its justifications) or category six (medical treatment information, its justifications or difficulties in diagnosis). Due to this uncertainty, we decide to keep them marked but not categorized. Upon analyzing the entire corpus, we discover that plastering actually includes the use of compress with warm or cold water and medicated plasters, which contain Chinese or Western medicine. As a result, we place the
former into category two and the latter in category six. Defining clear boundaries for social phenomena proves challenging. Despite establishing criteria for extended answers and their categorization, it is possible to overlook certain aspects that are not taken into considerations.

Regarding the strategies, our findings partially confirm B & L’s theory, but we do not find their category of “don’t do the act” or “opting-out strategy” (OOS) in this study. In general, the strategy of not disclosing the truth, especially when a patient has a fatal disease like cancer, aligns with B & L’s theory. However, in our corpus, doctors do not employ this strategy, even though consultations from oncology department are included in our data. This discrepancy may stem from the fact that in our data individuals seeking advice from doctors are often not the patients themselves. Therefore, even if the patient has a terminal illness, the doctors will not employ avoidance strategies, but rather give medical advice bluntly.

Another difference lies in the number of categories within PPS and NPS. B & L’s framework consists of fifteen categories in PPS and ten in NPS, while our framework includes three categories in PPS and seven in NPS. This deviation can be attributed to Mandarin Chinese not being a derivative and inflectional language. Consequently, strategies such as point-of-view distancing through the use of past tense for directive speech acts and nominalizing are not employed by native Mandarin Chinese-speaking doctors. Grundy (2020), in line with Matsumoto (1988) and Mao (1994), criticizes B & L’s claim of the universality of politeness strategies. The present author believes that B & L’s five general strategies exist in most cultures, but the categories within each strategy, particularly those within PPS and NPS, vary across cultures.

Our research findings align closely with Hu (2016) who also extracts categories of BORS, PPS, NPS and ORS from doctor discourse, including extended answers. However, our results differ from other studies focused on Mandarin Chinese clinical interviews. For instance, Liu & Liu (2011) identified three categories, PPS, NPS and ORS, whereas Long et al. (2012) only considered two: PPS and NPS. The key distinction lies in the categories encompassed by each strategy. While we will not delve deeply into this issue here due to the differences in the analyzed corpus (our focus on doctor’s extended answers versus their broader examination of doctor discourse), we do disagree with these studies on the classification of deference as a positive politeness strategy.

Liu & Liu (2011), Long et al. (2012) and Hu (2016) all categorize terms of deference like “‘senior grandpa’ (‘laodaye’), “Sir” (“xiansheng”), “you” (“‘nin”—akin to the French “vous”) as part of PPS. However, we have reservations about this categorization. In the framework proposed by B & L, deference is placed under NPS. They describe how in imposing a speech act, the speaker uses deferential language to elevate the status of the hearer. In Mandarin Chinese, the term “nin” is considered deferential only when used in singular form (Shi 2006). “Nin” has three main usages: (i) addressing elders or those of higher social status, (ii) addressing strangers, and (iii) addressing someone with a relatively high level of imposition. In the second usage, “nin” could fit within a PPS context. For example, when expressing optimism and empathy in an extended answer, a doctor might use it. Instances of this usage can be found in conversation 119 of our corpus, such as “Don’t worry about the examination. The doctors may help you
(“nin”). however, this study includes the third usage of “nin” as part of NPS. Thus, attributing all instances of “nin” to PPS might be misleading.

As to the frequency of the general strategies, the predominance of NPSs in our findings, alongside minimal usage of ORSs and a lower frequency of BORSs and PPSs, highlights a unique pattern that diverges from previous research.

The contrasting findings with Hu (2016), where NPSs were more prevalent in our study, suggest potential variations in communication strategies across different contexts or data sources. The observation by Long et al. (2012) of similar frequencies in NPSs and PPSs in clinical interviews within inpatient department underscores the impact of familiarity and solidarity on language selection among healthcare professionals.

The discrepancy with Liu & Liu’s (2011) findings regarding prevalence of PPSs versus NPSs may stem from differing conceptualization or operational definitions of these strategies. Our clarification on the distinction between PPSs, emphasizing intimacy or solidarity, and NPSs, focusing on deference or alienation, sheds light on the nuanced nature of language use in doctor-patient communication. In outpatient clinical settings, where doctors may lack familiarity with patients, the prevalence of NPSs in imparting treatment recommendations aligns with the need to mitigate potential FTAs. Utilizing minimizing strategies, such as providing explanations and reasons for recommendations, exemplifies the delicate balance between effective communication and patient rapport in healthcare interactions.

The recognition that PPSs and NPSs are not mutually exclusive and can coexist in doctor-patient discourse underscores the complexity of language use in convey empathy, understanding, and directives concurrently. The higher frequency of NPSs over PPSs in our study reflects the necessity for healthcare providers to assert treatment decisions while maintaining a patient-centered approach.

Overall, our study contributes profound insight into the communication strategies employed by doctors in outpatient clinical teleinterviews, emphasizing the importance of adapting language choice to varying patient dynamics and healthcare contexts.

**Conclusion**

This paper utilizes corpus linguistics and discourse analysis to categorize doctors’ extended answers in clinical teleconsultations and communication strategies used in these answers, as well as to quantify the frequency of each category. Our findings reveal seven categories of extended answers, with Category Seven (additional information on conditions for disease and treatment diagnoses) being the most prevalent at 40.6%. Category Six (information pertaining to diagnoses justifications or explanations) follows closely at 30.9%. The remaining categories had lower frequencies ranging from 3.2% to 8.3%. At a broader level, our analysis extracts four strategies from the corpus: BORS, PPS, NPS, and ORS. Among these, NPSs encompass seven categories and are the most frequently used, constituting 83.4% of all instances. Category five (delivering vague diagnoses) holds the largest share at 36.2%, followed by
Categories six (providing justifications for diagnoses) at 26.3%. The remaining categories are considered low frequency as they are utilized less frequently. Within the low frequency NPS categories, Category Four (minimizing imposition) and Category Seven (explaining reasons for inaccurate diagnoses) account for 13.5% and 4.9% respectively. Categories One to Three collectively represent only 0.2%, 1.4% and 1.0%. BORSs make up 9.2%, with Category One (directly requesting patients to accept specific treatments) and Category Two (directly requesting patients to accept rehabilitation proposals or precautions) each holding 4.6%. PPSs account for 6.3%, with Category Three (being optimistic) being prominent at 3.6%. Categories One (using in-group markers) and Two (employing consolidation routines) represent 1.2% and 1.5%. ORS, the least utilized strategy, comprises 1.0% of the 586 cases analyzed.

References


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**Figures**
Figure 1

A snapshot of corpus analysis results

Supplementary Files

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- 2103.doc