



Interruption and patient satisfaction in resident-patient consultations

Interruption and patient satisfaction

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Abstract

Purpose – The purpose of this paper is to examine interruption patterns between residents and patients as well as the correlations between three categories of interruptions and patient satisfaction.

Design/methodology/approach – A total of 40 resident/patient consultations in a Canadian clinic were audiotaped, transcribed and analyzed for intrusive, cooperative and unsuccessful interruptions.

Findings – Residents made significantly more interruptions than patients, especially in the categories of intrusive interruptions. These findings provide support for situated identity theory. High correlations were found between residents and patients on all three categories of interruptions, providing unequivocal support for communication accommodation theory. Patient satisfaction was negatively correlated with residents' intrusive interruptions and positively correlated with residents' cooperative interruptions. Patient satisfaction was higher among patients those who inserted more cooperative interruptions; to increase patient satisfaction, it is necessary to raise patient participation in the medical consultation. In comparison with healthier patients, sicker patients were interrupted more frequently and were less satisfied with the way they were treated.

Originality/value – The negative correlations between residents' intrusive interruption and patient satisfaction, as well as the positive correlation between patient satisfaction and residents' cooperative interruption provides evidence that patients' perception of the medical consultation is shaped by the nature of interruptions.

Keywords Patients, Communication, Patient care

Paper type Research paper



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According to situated identity theory (Alexander and Lauderdale, 1977; Goffman, 1959), a certain identity must be established in a social setting as a prerequisite for any social act to occur (Alexander and Lauderdale, 1977; Goffman, 1959). Communicative behaviors of the actors are guided by this identity-in-the-setting, either as an expression or as a reinforcement of the chosen identity. In physician-patient interactions, the social identities of the two parties are well-defined before the patient enters the consultation room, with the physician being the authority and the patient being the recipient of this authority. Thus their interaction would be characteristic of an asymmetrical power display (Li *et al.*, 2007). One linguistic device of the powerful party taking control over the process and content of a discourse would be frequent interruption of the less-powered party. In this paper, we studied the interruption patterns in a sample of 40 resident-patient interviews recorded in a Canadian clinic. Specifically, we examined the frequency and the manner in which residents interrupted patients and vice versa, as well as whether residents' interruption patterns were correlated with patient satisfaction. Although interruptions between physicians and patients have been studied and patient satisfaction with the medical interview has also been examined, the relationship between the two has yet to be explored. Therefore, the main goal of our study was to examine how interruption patterns, residents' and patients', influenced patients' satisfaction of the medical interview.

Past research on interruption patterns between physicians and patients has focused on who interrupt whom more frequently. Several studies have reported that physicians interrupted patients more frequently than vice versa (Beckman and Frankel, 1984; Marvel *et al.*, 1999; West, 1984). If comprehended in light of situated identity theory, this phenomenon is not surprising. In order to have certain control over the content and process of the medical interview, physicians need to navigate the conversation by inserting interruptions. It is puzzling that some studies found the opposite: patients interrupted physicians more frequently (Arntson *et al.*, 1978; Irish and Hall, 1995) or no difference existed between physicians and patients in their interruption frequencies (Street and Buller, 1988). To unpack this puzzle, Li *et al.* (2004) proposed to first categorize interruptions into intrusive, cooperative, and unsuccessful, then, compare the frequencies between physicians and patients. It was found that physicians and patients interrupted differently, the former more intrusively and the latter, more cooperatively. More importantly, when physicians interrupted patients, they were unsuccessful only 6 percent of the time. When patients interrupted physicians, they were unsuccessful 32 percent of the time. It was also reported that male physicians had a tendency to intrusively interrupt female patients more than male patients, and female patients engaged in more cooperative interruptions than male patients. These findings seem to support an early study by West (1984) who reported that male physicians interrupted female patients more frequently than male patients, and female physicians did not interrupt male and female patients differently. However contradictory findings have also been reported by Irish and Hall (1995) that there were few differences between male and female physicians in their interruption behaviors with patients.

How do interruption patterns, physicians' and patients, influence patients' satisfaction? As no prior research could be found on this topic, we reviewed relevant literature on patient satisfaction. Researchers have reported that patient satisfaction was positively and consistently associated with physicians' patient-participatory approach to medicine (Bertakis *et al.*, 1991; Buller and Buller, 1987; Evans *et al.*, 1992;

Street and Gordon, 2006). Patients were more satisfied with the consultation and treatment if they had a chance to ask questions during the interaction (Li and Lundgren, 2005), and were allowed to participate in the decision making process (Gattellari *et al.*, 2001). Patients preferred physicians with a consultative communication style to physicians with an authoritative approach (Bertakis *et al.*, 1991; Bradley *et al.*, 2001). Li *et al.* (2007) found that close-ended questions and facilitative statements (back-channel responses, changing the subject, checking for understanding, and asking the patient's opinion) had a negative effect on patient satisfaction. The author argued that close-ended questions did not encourage patient participation in the conversation, and that physician facilitative statements may have been perceived by patients as controlling and interruptive. Frederikson (1995) found that dealing with patient concerns, exploring patient expectations, patient ideas and discussing problem solutions were directly and positively correlated with patient satisfaction. Frederikson pointed out that patients placed importance on receiving information from physicians, but only when the exchange allowed them to participate: they liked to be active rather than passive recipients of medical care.

Furthermore, patient satisfaction was greater if the physician was courteous and professionally competent (Li *et al.*, 2007; Schneider and Tucker, 1992). Patients were satisfied when the physician expressed warmth, actively listened, volunteered information to the patient, provided explanations of the patient's condition, and expressed emotional support and trust in the patient (Ben-Sira, 1980; Bensing, 1991; Comstock *et al.*, 1982; Hall *et al.*, 1993; Rowland-Morin and Carroll, 1990). Patient satisfaction was also related to whether the physician was thorough, considerate, and humane (Murphy-Cullen and Larsen, 1984). Bertakis *et al.* (1991) concluded that since physicians control the pace and content of medical encounters, it is imperative to continue the study of physician communicative behaviors and patient satisfaction, with the hope that research may be able to help physicians modify their communication patterns, thus increasing patient satisfaction.

In the present study, we assessed patient satisfaction in four categories: affect, communication, expertise and overall. We explored whether a significant correlation existed between residents' interruption patterns and patient satisfaction.

A related issue of interest to us was whether residents and patient converged or diverged to each other's interruption patterns? According to communication accommodation theory (CAT), interlocutors have a tendency to either converge or diverge their linguistic codes during conversations (Giles and Smith, 1979; Giles *et al.*, 1987). A high correlation would indicate a tendency to converge their respective interruption styles, and a low correlation would show a tendency to diverge from each other's interruption styles. One previous study on interruption patterns in a simulated physician-patient sample reported that there was a tendency for the interlocutors to converge to each other's interruption styles (Li, 2001). It is unknown whether this convergence pattern would occur in actual physician-patient communication. Therefore, we examined the convergence-divergence pattern in the present study.

The categorization of interruption in the present study was identical to a previous physician-patient study (Li *et al.*, 2004). Interruptions were classified into intrusive and cooperative depending on the function of an interruption. If an interruption functioned to take over the floor, or to change the topic, or to express a disagreement, or to summarize what had been presented and then change the topic, it was categorized as

an intrusive interruption. This type of interruption has been seen as a power device by the interrupter to the interruptee (Ferguson, 1977; Kollock *et al.*, 1985; Hawkins, 1991; Robinson and Reis, 1989; Zimmerman and West, 1975). On the other hand, if an interruption was used as a request for clarification, or to assist the current speaker in finding the right expression, or to show agreement with what was being said, it was categorized as a cooperative interruption. This type of interruption served to show collaboration and solidarity between the interlocutors (Goldberg, 1990; Hayashi, 1988; Moerman, 1988; Tannen, 1994). Extending previous research, the present study examined the interruption patterns in a sample of resident-patient interviews and explored the relationship between interruption patterns and patient satisfaction.

Research questions

In the context of the above literature review, five research questions emerged:

- RQ1.* Was there a significant difference between the frequencies of residents and patients in intrusive, cooperative, and unsuccessful interruptions?
- RQ2.* Were there gender differences in the three categories of interruptions for residents and patients respectively?
- RQ3.* What were the interruption patterns in the four gender combinations (male resident/male patient, male resident/female patient, female resident/male patient, and female resident/female patient)?
- RQ4.* To what extent were different categories of resident and patient interruptions correlated with patient satisfaction?
- RQ5.* What categories of residents' and patients' interruptions were correlated?

Methods

Recruiting participants

This study took place at the John G. McKenzie Family Practice Clinic (Faculty of Medicine, University of British Columbia) in Prince George, British Columbia, Canada. Upon finishing their courses, medical students are required to complete a two-year residency program before pursuing family medicine. Residents mostly conduct medical consultations with patients alone. Experienced family physicians provide guidance and assistance to residents when needed.

First and second year residents were given background information on the objectives of the study. All residents, five females and four males agreed to participate. They signed a consent form and were given a code number to maintain anonymity.

A table and a chair were placed at the entrance to the clinic and the researcher greeted patients and briefly informed them about this study and asked for their participation. They were told that if they agreed to participate in this study, their consultation with their physician would be audiotaped and that they would need to fill out a questionnaire when they came out of the consultation room. Those who agreed to take part were reassured that their responses to the questionnaire would not be seen by their physician, and that they could withdraw at any time should they so wish. Eighty-eight percent of the patients approached agreed to participate in this study.

The mean age of patients was 43.43 years (SD = 14.98) and the majority had some post-secondary education (37.5 percent community/technical college, 22.5 percent university). On a Likert scale, “no schooling” was scored as 1, “primary school” was 2, “middle school” was 3, “high school” was 4, and “university” was 5. The majority (60 percent) were currently employed, and English was the first language of 39 out of 40 of the patients. The patient whose first language was not English rated her English as “fair”. Patients were asked to rank their health status; “excellent” was scored as 1, “good” was 2, “fair” was 3 and “poor” was 4. The majority of the patients rated their health as either “excellent” or “good” (21.1 percent and 55.3 percent, respectively); 15.7 percent rated their health as “fair”, and 7.5 percent as “poor”. The appointments were non-emergency in nature and the health problems included a common cold, back pains, pregnancy check-ups, car-accident related problems and regular physical examinations.

A quota system was used for each of the four gender combinations. Availability of the residents took priority. Data collection started with all four gender combinations simultaneously and was completed within a year because residents rotated among several sites and data were only collected at one site. A total of 40 dyads were audiotaped, ten in each gender combination: male resident/male patient, male resident/female patient, female resident/male patient, and female resident/female patient.

Video cameras were located in all examination rooms in the clinic for evaluation purposes, and consisted of inconspicuous units embedded in thermostats. For the purposes of this study, the lens of the camera was covered to provide audio only. The recording apparatus (VCR) was located in the room adjacent to where the video-camera was located, and could be adjusted without coming into contact with either the resident or the patient.

Transcribing consultations and scoring of interruptions

The audiotaped consultations were first converted into digital (MP3) format. The consultations were then transcribed by two trained research assistants. Overlapping talk was marked by two single slashes, one marking the onset and the other marking the ending. To score for interruption, both transcripts and audiotapes were used. Scorers were required to write down all identifiable details of interruptions including the provider and the words or sentences prior to the interruption, the interruption proper, and the words or sentences immediately after the interruption. In addition, pause, laughter, and unintelligible words were recorded if they were related to an interruption. Tone of voice was noted if it was related to the identification of an interruption. Interruptions were first distinguished between silent and overlapping, successful and unsuccessful. Consistent with the stand of Hutchby and Wooffitt (1998), we did not judge the existence of an interruption based on overlapping talk alone. Rather we took the conversation context into consideration (Hutchby and Wooffitt, 1998). When no overlapping talk existed, an interruption was determined successful if the second speaker started talking while the first speaker’s utterance was not completed; the second speaker continued talking and the first speaker stopped talking abruptly. When an overlapping talk existed, an interruption was judged successful if the second speaker started talking while the first speaker was also talking. Both talked simultaneously for some time but the first speaker yielded the floor to the second

speaker before completing the utterance (Beaumont and Cheyne, 1998; Jacob, 1974; Mishler and Waxler, 1968). In these instances, the first speaker's utterance was not completed judged by grammar or tone of voice, i.e. when there was no change in the tone of speech in the final syllable (Duncan, 1972).

In our data, there were a dozen times when the speakers interrupted each other consecutively. Following Kennedy and Camden (1983), we coded these sequences as independent interruptions.

An interruption was judged unsuccessful if the second speaker started talking while the first speaker was talking; both talked simultaneously for some time; the first speaker did not yield the floor; the second speaker yielded. In cases of no overlapping unsuccessful interruptions, the second speaker attempted to interrupt by inserting an utterance when the first speaker paused between relevant transition places (Sacks *et al.*, 1974); the first speaker continued talking while the second speaker gave up the attempt to interrupt.

Thus successful and unsuccessful interruptions were distinguished on the basis of grammar, and tone of voice. As stated previously all successful interruptions were differentiated into intrusive, cooperative, and other categories. Each subcategory was coded according to the definition by Murata (1994), Kennedy and Camden (1983), and Li (2001). Intrusive interruption consisted of four subcategories: disagreement, topic change, floor-taking, and tangentialization (summarize what has been presented and then change the topic). Cooperative interruption was made up of three subcategories: agreement, assistance and asking for clarification. These categorizations were based on the function they played in the context. Unsuccessful interruptions did not have subcategories. Examples for each category are presented in the Appendix (where R refers to resident and P refers to patient).

The first scorer coded the data for frequencies of successful and unsuccessful interruptions using the coding scheme presented above. A second scorer independently coded 15 percent of the data. The inter-scorer reliability (Pearson Correlation) was 0.91 for intrusive interruptions, 0.89 for cooperative interruptions and 0.90 for unsuccessful interruptions. Differences between the two scorers were settled by reviewing the definitions.

Patient questionnaire and patient satisfaction

Immediately after their medical visits, patients were asked to fill out a short questionnaire that contained questions on various types of satisfaction, health status, and demographic information. The questionnaire was adapted from Roter (1997). Hall *et al.* (1994) found the questionnaire to be reliable and valid (Cronbach alpha = 0.93).

Patient satisfaction was measured by 13 questions that constituted four categories: overall satisfaction, communication satisfaction, expertise satisfaction and affect satisfaction. The four categories were similar to those used by Evans *et al.* (1992), who differentiated physician's communication style into expressed interest, technical competence and affective tone. The questions which constituted the four satisfaction constructs were selected by the authors using a theory-driven approach.

Overall satisfaction was made up of four questions: "the goal of my visit today was achieved," "my doctor told me all I wanted to know about my condition and treatment," "I have health problems which should have been discussed today but were not" (the scale for this question was reversed for data analysis) and "my doctor answered all my

questions." Item analysis revealed a reliability coefficient of 0.60 (standardized alpha), with an item mean of 4.41 (SD = 0.01). On a Likert scale, "strongly disagree" was coded as 1, "disagree" as 2, "unsure" as 3, "agree" as 4 and "strongly agree" as 5. A mean of 4.41 indicates fairly high satisfaction.

Affect satisfaction contained three questions: "my doctor acted bossy and domineering at times during my visit today," "my doctor made me feel important today," and "my doctor seemed in a hurry." Standardized item alpha was 0.02 with an item mean of 4.39 (SD = 0.07).

Communication satisfaction consisted of three questions: "my doctor asked me whether I understood what he or she had told me about my condition or treatment," "whether I was satisfied with the way my doctor and I communicated today," and "during my visit today, whether I felt there were times when my doctor and I miscommunicated." Standardized alpha was 0.51, with an item mean of 4.44 (SD = 0.12).

Expertise satisfaction consisted of three questions: "I have great confidence in my doctor," "my doctor has a reasonable understanding of my life circumstances," and "my doctor has a good understanding of my past health history." Standardized alpha for expertise satisfaction was 0.79, with an item mean of 4.07 (SD = 0.15).

According to Cohen (1990), the standardized item alpha of 0.79 was considered high, 0.60 acceptable, 0.51 low, and 0.02 unacceptable. When analyzing the data using affect communication, we also used all three individual items.

Treatment of data

The frequencies of cooperative, intrusive, and unsuccessful interruptions were summed for residents and patients. The frequencies from three subcategories, agreement, assistance, and clarification, were summed to make the score for cooperative interruption. The frequencies of disagreement, topic change, floor-taking, and tangentialization were added to make the score for intrusive interruption.

Due to the differences in the length of consultations, frequencies of interruptions do not make meaningful comparisons. Following standard practice in the field (Bull and Mayer, 1988; Li *et al.*, 2004), all frequencies were converted into rates, which were derivations of frequencies divided by the number of utterances of the partner. An utterance was defined as the smallest string of words with meaning (Bales, 1951; Hall *et al.*, 1994; Li, 2001). Speaking time was not used because it included physical examination time.

Due to the small numerators and large denominators, the rates were very small. Following Beaumont and Cheyne (1998) and Li (2001), the rates were multiplied by the grand mean of the number of utterances divided by two ($474.175/2 = 237.0875$). For example, for the resident in the first dyad, the frequency of cooperative interruption was 14, the rate for cooperative interruption was 17.02 ($14/195.00 \times 237.0875$). In this formula, 14 was the speaker's frequency for cooperative interruption, 195 was the partner's number of utterances, and 237.0875 (a constant) was the grand mean of the number of utterances by both residents and patients divided by two.

Results

Length of consultations

As measured by time. The average length of consultations, including time spent on physical examinations, was 1,180.35 seconds (SD = 689.59), or 19.67 minutes. There

was no statistically significant difference in the length of consultations conducted by male and female residents, although male residents conducted longer consultations (22.18 minutes) than female residents (17.17 minutes).

As measured by the number of words. The average number of words spoken during consultations was 1,319.53 (SD = 781.26) and 888.95 (SD = 695.57) for residents and patients respectively. The difference was statistically significant, $t(39) = 6.13, p < 0.01$. Male residents spoke more words on average (1,560.90) during their encounters with patients than their female counterparts (1,078.10), $F(1, 38) = 4.13, p < 0.05$.

As measured by the number of utterances

The mean number of utterances made during the consultation was 266.78 (SD = 154.92) for residents and 207.40 (SD = 128.56) for patients. The difference was statistically significant, $t(39) = 6.86, p < 0.01$. Male residents made more utterances than female residents (310.05 vs 223.50 respectively), but this difference was not statistically significant. Interestingly, patients made more utterances with male residents than with female residents (252.85 vs 162.00), $F(1, 38) = 5.57, p < 0.05$. Furthermore, the total number of utterances made by both residents and patients was greater for the male resident dyads (562.85 for M/M and M/F) than for the female resident dyads (385.50 for F/F and F/M). This difference was statistically significant, $F(1, 38) = 4.38, p < 0.05$.

Comparing interruption patterns between residents and patients (RQ1)

Mean rates of the three interruption categories for residents and patients were calculated and summarized in Table I. As can be seen in Table I, residents made more cooperative interruptions than did patients; ANOVA indicated a statistically significant difference, $F(1, 78) = 5.71, p < 0.05, \eta^2 = 0.07$. Residents also made significantly more intrusive interruptions than did patients, $F(1, 78) = 26.95, p < 0.0001, \eta^2 = 0.26$. Patients made significantly more unsuccessful interruptions than did residents, $F(1, 78) = 7.67, p < 0.01, \eta^2 = 0.09$. When residents interrupted patients, they were unsuccessful less than 3 percent of the time. When patients interrupted residents, they were unsuccessful 12 percent of the time (Table I). These differences are illustrated in Figure 1.

| Role | Gender | n | Cooperative | | Intrusive | | Unsuccessful | |
|------------------------|---------|----|-------------|-------|-----------|------|--------------|------|
| | | | M | SD | M | SD | M | SD |
| Resident ^a | Male | 10 | 12.90 | 9.45 | 5.11 | 6.42 | 0.55 | 1.10 |
| Patient ^a | Male | 10 | 9.88 | 6.91 | 1.03 | 1.28 | 1.88 | 2.07 |
| Resident ^b | Male | 10 | 14.10 | 13.00 | 2.07 | 1.52 | 0.39 | 0.91 |
| Patient ^b | Female | 10 | 9.53 | 9.30 | 1.01 | 1.00 | 1.78 | 2.41 |
| Resident ^c | Female | 10 | 27.78 | 12.89 | 10.09 | 4.74 | 1.61 | 2.45 |
| Patient ^c | Female | 10 | 20.57 | 10.93 | 2.31 | 2.01 | 2.11 | 3.21 |
| Resident ^d | Female | 10 | 20.78 | 17.06 | 4.79 | 2.50 | 0.08 | 0.27 |
| Patient ^d | Male | 10 | 9.42 | 8.41 | 0.51 | 0.62 | 1.80 | 2.04 |
| Residents ^e | M and F | 40 | 18.89 | 14.19 | 5.52 | 5.02 | 0.66 | 1.49 |
| Patients ^e | M and F | 40 | 12.35 | 9.90 | 1.21 | 1.44 | 1.89 | 2.38 |

Table I.
Mean rates of interruptions by role and gender

Note: The superscripts in the table separate the four gender combinations

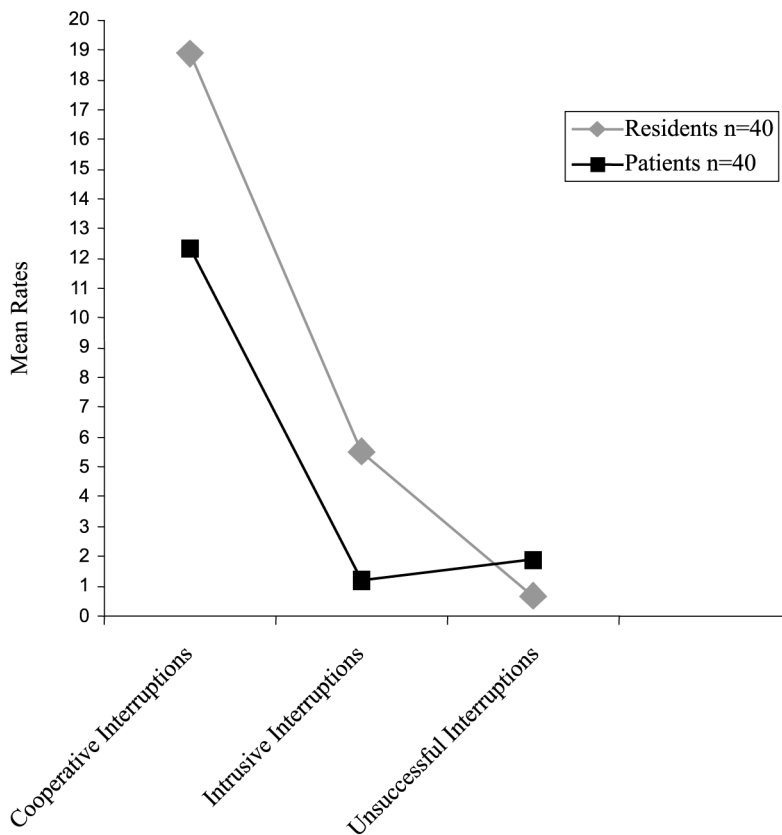


Figure 1.
Mean rates of interruptions by role

Comparing interruption patterns between males and females (RQ2)

Residents. Female residents made significantly more cooperative interruptions ($M = 24.28$, $SD = 15.15$) than did male residents ($M = 13.50$, $SD = 11.08$), $F(1, 38) = 6.59$, $p < 0.05$, $\eta^2 = 0.15$. Female residents also made significantly more intrusive interruptions ($M = 7.44$, $SD = 4.58$) than did male residents ($M = 3.58$, $SD = 4.80$), $F(1, 38) = 6.74$, $p < 0.05$, $\eta^2 = 0.15$. There was no significant difference between male and female residents in the unsuccessful interruption category.

Patients. Although female patients made more cooperative interruptions ($M = 15.05$, $SD = 11.39$) than did male patients ($M = 9.65$, $SD = 7.49$), this difference was not statistically significant ($p = 0.085$). Female patients also made more intrusive interruptions ($M = 1.66$, $SD = 1.68$) than did male patients ($M = 0.77$, $SD = 1.01$); this difference was barely significant ($p = 0.051$, $\eta^2 = 0.10$). There was no significant difference between male and female patients in the unsuccessful interruption category.

Comparing interruption patterns among the four gender combinations (RQ3)

Residents. Mean rates of the three categories of interruptions for the four gender combinations are presented in Table I. ANOVA indicated that the residents in the F/F

combination (female resident/female patient) engaged in significantly more cooperative interruptions than the residents in the M/M (male resident/male patient) combination, $F(1, 18) = 8.66, p < 0.01, \eta^2 = 0.33$. The residents in the F/F combination also carried out significantly more cooperative interruptions than the residents in the M/F (male resident/female patient) combination, $F(1, 18) = 5.58, p < 0.05, \eta^2 = 0.24$. No significant differences were found among the other gender combinations. ANOVA also indicated that the residents in the F/F combination engaged in significantly more intrusive interruptions than residents in the M/F combination, $F(1, 18) = 25.97, p < 0.0001, \eta^2 = 0.59$, and the F/M combination, $F(1, 18) = 9.78, p < 0.01, \eta^2 = 0.35$. No significant differences were found among the other gender combinations. In the unsuccessful interruption category, no significant differences were found among the residents in any of the gender combinations.

Patients. ANOVA indicated that the patients in the F/F combination engaged in significantly more cooperative interruptions than patients in the M/M combination, $F(1, 18) = 6.83, p < 0.05, \eta^2 = 0.28$, the M/F combination, $F(1, 18) = 5.92, p < 0.05, \eta^2 = 0.25$ and the F/M combination, $F(1, 18) = 6.53, p < 0.05, \eta^2 = 0.27$. No significant differences were found among the other gender combinations. ANOVA also indicated that the patients in the F/F combination engaged in significantly more intrusive interruptions than patients in the F/M combination, $F(1, 18) = 7.23, p < 0.05, \eta^2 = 0.29$. No significant differences were found among the other gender combinations. In the unsuccessful interruption category, no significant differences were found among any of the gender combinations.

Correlations between interruption and patient satisfaction (RQ4)

Pearson correlations were calculated among interruptions and patient satisfaction and patient demographic variables with all four gender combinations (Table II). The only significant correlation between interruptions and patient satisfaction was between affect satisfaction and patient cooperative interruption; patients who did more cooperative interruptions were more likely to think that the residents were warm and caring. Using the three items composing affect communication, we found that “my doctor seemed in a hurry” was significantly correlated with the frequency of unsuccessful patient interruption, $r(40) = 0.28, p < 0.05$, indicating that hurried residents did not allow patients to insert interruptions successfully. Patient self-rated health status had several significant negative correlations with resident interruptions; the poorer a patient’s health, the more they were interrupted. Patient age and education level had no significant correlations with resident or patient interruption scores.

Pearson correlations between interruption patterns and patient satisfaction were then calculated for each gender combination separately. In the M/M group, a significant negative correlation was found between residents’ intrusive interruption and patient expertise satisfaction, $r(10) = -0.64, p < 0.01$. In the M/F group, a significant negative correlation was also found between residents’ intrusive interruption and patient expertise satisfaction, $r(10) = -0.40, p < 0.05$. Interestingly, in the F/F group, a significant positive correlation was found between residents’ intrusive interruption and patient expertise satisfaction, $r(10) = 0.56, p < 0.01$. In the F/M group, a significant positive correlation was found between residents’ cooperative interruption and patient expertise satisfaction, $r(10) = 0.56, p < 0.01$. No other significant correlations were found.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----------------------------------|---------|--------|--------|---------|-------|-------|--------|--------|---------|-------|---------|-------|----|
| 1. Cooperative interruption (R) | - | | | | | | | | | | | | |
| 2. Intrusive interruption (R) | 0.43** | - | | | | | | | | | | | |
| 3. Unsuccessful interruption (R) | 0.20 | 0.33* | - | | | | | | | | | | |
| 4. Cooperative interruption (P) | 0.78** | 0.57** | 0.45** | - | | | | | | | | | |
| 5. Intrusive interruption (P) | 0.31* | 0.53** | 0.40** | 0.53** | - | | | | | | | | |
| 6. Unsuccessful interruption (P) | 0.25 | 0.18 | 0.46** | 0.24 | 0.25 | - | | | | | | | |
| 7. Communication satisfaction (P) | 0.12 | 0.09 | 0.06 | 0.17 | 0.11 | 0.17 | - | | | | | | |
| 8. Expertise satisfaction (P) | 0.01 | -0.15 | 0.08 | 0.04 | 0.07 | -0.11 | 0.22 | - | | | | | |
| 9. Affect satisfaction (P) | 0.19 | 0.23 | 0.13 | 0.28* | 0.08 | 0.03 | 0.25 | 0.48** | - | | | | |
| 10. Overall satisfaction (P) | 0.08 | 0.00 | 0.05 | 0.12 | 0.11 | 0.08 | 0.63** | 0.45** | 0.30* | - | | | |
| 11. Self-rated health status (P) | -0.43** | -0.31* | -0.30* | -0.40** | -0.26 | -0.07 | -0.12 | -0.02 | -0.39** | -0.13 | - | | |
| 12. Age (P) | -0.06 | 0.08 | 0.03 | 0.05 | 0.09 | 0.01 | -0.18 | 0.43** | 0.11 | 0.19 | 0.07 | - | |
| 13. Level of education (P) | 0.21 | 0.11 | 0.01 | 0.11 | 0.12 | -0.12 | -0.11 | -0.18 | 0.22 | -0.09 | -0.39** | -0.10 | - |

Notes: R refers to resident; P refers to patient; *Correlation is significant at the 0.05 level (one-tailed); **Correlation is significant at the 0.01 level (one-tailed)

Table II.
Correlations among interruption and patient satisfaction

Correlations among residents' and patients' interruptions (RQ5)

As indicated in Table II, significant correlations were found between resident and patient cooperative interruption scores, $r(40) = 0.78$, $p < 0.01$, and intrusive interruption scores, $r(40) = 0.53$, $p < 0.01$. A significant correlation was also found between patient and resident unsuccessful interruption scores, $r(40) = 0.46$, $p < 0.01$.

Discussion

This study shows that residents engaged in more interruptions than patients, both cooperatively and intrusively, substantiating support for situated identity theory (Alexander and Lauderdale, 1977; Goffman, 1959). Human communication is not an isolated linguistic phenomenon; rather it is embodied in the social relationships of the communicators. When a physician interacts with a patient, their perspective social roles are predefined, the former as the expert and caregiver, and the latter as the proletarian and care-receiver. This unequal-powered social relationship exerts strong influence on the fashion of their communication.

To empower patients, our finding suggests reducing the number of residents' intrusive interruptions. Significant negative correlations were found between the frequency of residents' intrusive interruptions and patient expertise satisfaction. The more residents intrusively interrupted their patients, the less patients thought of their professional qualifications which included patients' confidence in the residents and their perception of the resident's understanding of their health history. On the other hand, if residents interrupted patients in a cooperative manner, patients were more confident about their expertise, indicating the importance of mastering the art of interruption on the part of residents.

Another way to empower patients is to allow them to ask questions, make amendments to what they had said, and feel free to agree or disagree with the physician. A noticeable finding in our study was the significant correlation between the frequency of patients' own cooperative interruption and their affect satisfaction. It could indicate that when patients got a chance to interrupt their physicians cooperatively, they were more likely to think that their physicians were warm and caring. In the female resident/male patient combination, the frequency of patients' own cooperative interruption was also correlated with patients' overall satisfaction, an indication that patients were more satisfied if they participated in the conversation. These findings support the patient-participatory model (Evans *et al.*, 1992; Street and Gordon, 2006). The implication for practitioners is that to increase patient satisfaction, they should allow more patients' participation so they feel involved, empowered, and satisfied.

An interesting finding is the reciprocal relationship between residents' and patients' cooperative and unsuccessful interruptions as reflected in the high correlations. In a given dyad, if one party cooperatively interrupted the other more, he or she will be interrupted back in the same fashion. This finding provides evidence for communication accommodation theory (Giles and Smith, 1979; Giles *et al.*, 1987) in that an interruption convergence occurred. It is also in line with previous research on simulated physician-patient interruption patterns (Li, 2001). An enlightening note from this finding may be that the way residents talk to patients is mirrored by patients. That is, residents' communication style, to some extent, sets the tone for the medical

consultation. If residents are aware of this delineation, they might be more conscientious in developing a proficient communication style.

We also found that when residents interrupted patients, they were unsuccessful less than 3 percent of the time. When patients interrupted residents, they were unsuccessful 12 percent of the time. This finding is different from the unsuccessful interruption patterns between experienced physicians and patients in the same clinic. Li *et al.* (2004) reported that when physicians interrupted patients, they were unsuccessful 5 percent of the time. When patients interrupted physicians, they were unsuccessful 32 percent of the time. In our all-resident sample, the unsuccessful interruption rates were lower for both residents and patients than in the all-physician sample, indicating that residents managed interruptions better than experienced physicians. One explanation for this difference could be that residents, being paid on a salary basis, had fewer time constraints than physicians, being paid on a fee-to-service basis, and therefore did not mind being interrupted by patients. Another explanation could be that residents, being new in the profession, treated patients in a more egalitarian manner than did experienced physicians.

Among residents as well as patients, females made more interruptions than males both intrusively and cooperatively. In comparison with the other three gender combinations, the female/female dyads had significantly higher frequencies. This finding seems consistent with previous research that female/female conversations are more engaged and involved than other gender combinations (Tannen, 1994).

Finally, the significant correlations between patients' self-rated health status and the frequency of residents' interruptions should draw attention to researchers as well as to practitioners. The sicker the patient, the more he or she was interrupted; and the sicker the patient, the less likely he or she engaged in cooperative interruptions. That is to say, the sicker the patient, the less likely he or she participated in the consultation process. A related finding was the significant negative correlation between patients' health status and patient affect satisfaction, an indication that sicker patients thought that their physicians "acted bossy and domineering at times", "did not make the patient feel important", and "seemed in a hurry".

It is true that communication may be more difficult with sicker patients because their physical conditions may prevent them from being agreeable, articulate and cohesive. Nevertheless, it is essential to give sicker patients an opportunity to say what they need to say, because the missed information may be crucial for making correct diagnoses (Roter and Frankel, 1992). It is well-known that misdiagnoses can have negative consequences for patient health and health care cost (Guendelman and Witt, 1991; Makul *et al.*, 1995).

This study has several limitations. First, we sampled medical consultations among first and second-year practicing residents in a teaching clinic. The sampling procedure was not strictly random (although representative) and the sample size was small, therefore, generalization of the results to resident-patient communication should be cautious. Although in discourse analysis, small sample sizes are commonly allowed because the unit of analysis is the number of utterances (interruptions in this case). Nevertheless, larger sample sizes should be encouraged in future research. Second, the alpha coefficient for affect satisfaction was rather low which may have influenced the results. For future studies using this questionnaire, adjustments need to be made to the items representing this dimension. Third, in scoring interruptions, we may have

missed some unsuccessful interruptions due to the disadvantage of audio-recording. For example, if an interrupter moved his or her lip attempting to interrupt the current speaker, we would have missed it due to a lack of visual access. Finally, the categorization of interruptions we used is still in its exploratory stage. For example, the dilemma whether interruptions should be categorized on the basis of linguistic form or semantic function has been in debate among researchers. For example, an interruption can be identified as a cooperative interruption based on its function and as an unsuccessful interruption based on syntax. However, to be part of this discussion is exciting with the hope to see more research on this topic in future.

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Cooperative Interruptions

1. Agreement

Example:

R: 180 over 90, it just ah, just a little high,/and you should/...

P: /Yeah, it's high, y/ea, it's even a little higher than that.

2. Assistance

Example:

R: She needs her medication renewed /every.../

R: /every three/ month / she gets Nasonex.

3. Clarification

Example:

R: When you are pregnant, you have hormones that are called [relaxants] that are released

P: /ya so I am/..

R: /that allo/ws your hips to become loose so that when you come to deliver the baby that is not hard and it's more

Intrusive Interruptions

1. Disagreement

Example

R: So you kn/ow where and/...

P: /No, gee, no/, I had ah, she just ran her finger over one spot there and she felt it and now I'm trying to find, maybe, can't even remember what leg it was now. She was ah, we were cuddling last night and she was running her hand over my leg and she felt a spot and I'll be darned.

2. Floor-taking

Example:

P: I'd go to physio, about two or three sessions, bang it was gone. So, it did help back then, but it wasn't quite as bad, I wasn't getting any pain in the /cheeks...the.../

R: /Mm, Now is thi/s how it presented the first time, same kind of pain bilaterally...?

3. Topic-change

Example:

R: Okay, let me just see if I /can feel it/...

P: /I have, I ha/ve borrowed some anti-inflammtories off my sister- in-law there on the weekend.

4. Tangentialization

Example:

P: The doctors from the autopsy recommended all the kids in /the family do a, a, a...

R: /Ohh. Well, I know/, and you know ah, were you seeing a cardiologist for this before?

Unsuccessful Interruptions

Example:

R: Okay. There's various hypertension formulas that you can get, an/d you may wan/t...

P: /Mmhm I want/...

R: /essentially gar/lic is good for high blood pressure.

Figure A1.
Examples of interruptions

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