# Qualitative and Quantitative Evidence Regarding the Intrusiveness of Recording Devices in Naturalistic Research

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## ABSTRACT

*Critics of naturalistic social science research charge that participant awareness of the existence of a recording device alters the behavior of the research participants, known as the "Hawthorne effect." This study compares segments of talk in which participants explicitly orient to the recording device against segments of talk without such orientation to determine how and if such orientation alters the behaviors of participants. Conversational data were gathered over a six-year period comprising 64 independent conversations involving 213 subjects. Data were transcribed and coded following the conventions of Conversation Analysis. A total of 18 of the 64 transcribed recordings (28.1%) contained references to the recording device. A total of 284 lines in these eighteen transcribed conversations had references to the recording device and/or the researcher, out of a total of 3,906 lines in the 18 transcriptions (7.3%), or out of a total of 11,675 lines in the entire conversation library (0.02%). Lines from both types of compared segments were coded for turns-at-talk by individual participant. A total of 227 unique turns-at-talk (3.3% of total) in which the recording device was directly addressed were compared to 6,597 unique turns-at-talk in which the recording device was not relevant to the content of the conversation. Results indicate that no statistically significant differences occur between compared segments of talk, thus failing to find evidence to support claims of a "Hawthorne effect" in naturalistic social science research.*

## Introduction

Within humanistic and social scientific research camps, arguments ensue regarding the validity or accuracy of the opposing camp's research methods. In the field of communication, this debate is particularly problematical in that the nature of the phenomena under investigation is necessarily complex. Put another way, communication involves symbolic interaction between at least two individuals with free will but with a proclivity toward following rules in order to increase the efficiency of understanding. Free will is not predictive, thus necessitating more humanistic approaches in studying human communication. Rule following is predictive, thus allowing for more social scientific approaches.

Communication scholars have long recognized the need for multi-method approaches for studying human communication. Indeed, as LeBlanc (1995) argued, such a multi-method approach is necessary given that communication is "concurrently the object of study and the means by which study is both conducted and presented." However, despite such idealism

regarding methods of inquiry in the field (and by extension, other disciplines under the broad heading of humanities and social science), both pragmatic and philosophical differences have hindered any real progress in methodological triangulation (LeBlanc, 1995).

A primary argument that social scientific scholars have levied against humanistic scholars utilizing intrusive recording of naturally occurring conversation is that the participants' knowledge of the recording device will necessarily bias the results, as participants are likely to alter their behaviors. To test this conclusion, investigators would have to conduct a field experiment designed to compare the behaviors of participants in reference to the possible effects of the recording device. This study aims to conduct such a comparison.

## Review of Literature

In many fields of inquiry, questions regarding what, if any, effect the recording device has on the outcome of research has generated much debate. More pointedly, scholars have expressed most concern over the effect on the outcome when subjects are aware they are being recorded for research. According to Jones (1992), the concern over the effect of subject awareness, known as the "Hawthorne effect," has influenced human research since the late 1920's as a consequence of the studies of workplace behavior conducted at Western Electric's Hawthorne Plant. Jones, a sociologist, re-examined the data and methods from the original experiments and concluded there was little evidence to support the claim of a "Hawthorne" effect. Pringle and Stewart-Evans (1990) investigation of the effect of videotaping during physician consultations corroborate these claims.

However, according to Sommer (1968), although this effect may be marginal in single variable laboratory experiments, the effect occurs more often than not in field observations. Adair (1984) argues that the "Hawthorne" effect typically occurs in field experiments due to uncontrolled variables. Adair suggests that subjects often adapt their behaviors to the context. Therefore, such an effect due to subjects' awareness of participation in research would be difficult to control in the field.

Chiesa and Hobbs (2008) argue that over the intervening years of scholarly debate on the "Hawthorne" effect, the term has become "muddled" with complexity being applied to many different subject awareness outcomes. Regardless, scholar concern persists. In the field of communication, the great divide between the two primary research paradigms (humanistic and social scientific) has often hinged on the question of subject awareness of the research, and in particular the recording device used for conversational research. To investigate this further, the following research questions are proposed:

RQ$_1$    Are pragmatic features of naturalistic conversational data affected by reference to the recording device?

RQ$_2$    Can naturalistic conversational data be coded quantitatively to compare features of talk between groups of segments?

RQ$_3$    Provided naturalistic conversational data can be coded quantitatively, is there a statistically significant difference in qualities between segments of

> talk in which the recording device is directly addressed and segments of
> talk in which the recording device is not directly addressed?

Perhaps a more effective approach to answering the question regarding the effect of subject awareness of a recording device in conversational research is to utilize multiple methods within the same study using the same naturalistic data. Therefore, to answer the first question, recorded conversations will be transcribed for analysis of pragmatic features, as typical in conversation analytic and ethnomethodological research. To answer the second question, transcriptions of recorded conversations will be compiled and examined for possible qualities that may be re-coded quantitatively. To answer the third question, re-coded conversational data will be compared using descriptive statistical techniques.

## Methods

To conduct this study, two traditionally disparate methodologies (humanistic and social scientific) were utilized in sequential order: a) conversation analysis and ethnomethodology (humanistic), and b) descriptive statistical techniques (social scientific). The output of the first set of methods was utilized to create the variables for the second set. The overall structure of this manuscript thus follows the social scientific convention. However, the convention for presenting qualitative data (as in conversation analytic and ethnomethodological approaches) will be presented first below.

### Conversational data

Conversation analysis is based on the ethnomethodological tradition that assumes that individuals interact with each other in orderly, patterned ways (Schegloff & Sacks, 1973). More specifically, this methodology focuses on the pragmatic characteristics of everyday routine and mundane, face-to-face interaction (Sacks, 1989). This type of investigation typically utilizes transcriptions of recorded naturally occurring conversation. For this study, transcriptions were made by one of the participants in each recorded conversation, and revised and edited by the researcher, using the transcription system developed by G. Jefferson[1].

For this study, conversational data were gathered with audio recording devices over a six-year period comprising 64 independent conversations involving 213 subjects. A total of 18 of the 64 transcribed recordings (28.1%) contained references to the recording device. A total of 284 lines in these eighteen transcribed conversations had references to the recording device and/or the researcher, out of a total of 3,906 lines in the 18 transcriptions (7.3%), or out of a total of 11,675 lines in the entire conversation library (0.02%). All excerpts in this study are taken from the researcher's conversation library.

One of the first characteristics of talk to be formally studied is turn-taking. According to Sacks (2004), conversation is organized overwhelmingly by speakers taking turns at talk. Additionally, Sacks adds that each speaker takes a turn at talk in relatively equal lengths. Grice (1989) argued that interactants normally abide by four maxims of quantity, quality, relevance, and manner, thus

demonstrating cooperation in conversation. In the following excerpts turn-taking is very evident between interactants.

(1)[2] Romantic dyad (DC94014)

```
048   M:    Talk to your mom last night?
049         Yeah?
050   S:    Yeah
051   M:    You talk to her every night
052   S:    No I don't
053   M:    Yes you do
054   S:    No I talk to her like every four every three or four days
055   M:    It seems like you talk (.) every time I'm over there you call
056         and I'm over there every night
057   S:    Well you don't come over
058   M:    Yes I do
```

(2)[3] Platonic group (DC94001)

```
050   Al:   It's T((***))'s turn
051   C:    What do you want for this Tam
052   T:    Tens, a ten
053   J:    It's my turn
054   C:    Can I have those chips real quick
055   Al:   Now I'm really hungry
```

Both samples demonstrate turn-taking following Grice's maxims and Sacks' description of typical turn-taking behavior. The first research question posed asked if addressing the recording device influenced pragmatic features of conversations. The first two excerpts came from full transcripts that did not contain any reference to the recording device. In the following two excerpts, interactants make a direct reference to the recording device.

(3)[4] Romantic dyad (DC94018)

```
004   P:    It should be recording now are you saying anything
005   N:    Yes, but like when you you could have like an echo when you talk
006         say something
007   P:    Yes I know
008   N:    You can hear an echo
009   P:    Well hopefully it's picking up
010         I don't know
011   N:    What do you want to talk about
012   P:    Who cares
013         We just got to talk long enough to do this stupid tape
014   N:    Honey don't say that
```

(4)[5] Platonic group (MY95013)

```
031   L:    Are you taping that? Oh, I'm so sorry!
032         ((Laughter))
033   Sz:   L((***))'s true self
034   St:   That was funny
035   L:    I didn't mean it, I swear
036   Ct:   That's ok, I just got your true self on tape
037   Sz:   Fuck You! Bleep, bleep
038   St:   You don't have to repeat it
```

Regardless of the interactants knowledge of the recording device, and even in spite of direct reference to the recording device, interactants continued taking turns at talk, as described by

Sacks. Interestingly, in excerpt (3), the interactants tacitly acknowledge that the content of the conversation is irrelevant to the task at hand, i.e., recording the conversation for research. Additionally, in excerpt (4) one of the interactants (Sz:) made fun of behavior of another (L:), which was subsequently ratified by two other interactants (St: and Ct:). Acknowledgement of the untoward behavior being recorded on the device did not alter the turn-taking behavior.

The second research question asks if characteristics of conversational data (such as demonstrated above) can be coded for quantitative analysis, such as for comparison of features of talk between groups of segments. Using turn taking as an example of a feature of talk, a turn (or utterance) could be symbolized as a unit for analysis. It should be possible to count the turns at talk to determine if Sacks conjecture is correct that interactants take equal turns at talk. For this study, turns at talk where counted for each individual in all 64 transcribed conversations. It is important to note that individual turns vary in length relative to other turns. For example, in excerpt (1), lines 55 and 56 represent 1 turn at talk for M:, following by one turn at talk for S: (line 57). Therefore in excerpt (1), M: has 5 turns at talk and S; has 4.

Given this quantitative coding scheme for turn-taking, the total number of turns at talk for the entire conversation library (N = 64) was 6,818. Of this figure, 227 turns at talk (3.3%) occurred within segments in which the recording device was directly addressed. Another way to determine whether the acknowledgement of the recording device influenced conversational behavior would be to compare the ratio of turns at talk for interactants in segments where the recording device was directly addressed against the ratio of turns at talk for interactants for non-addressed episodes.

**Statistical Data**

In order to control for potential bias (a social scientific convention), all transcripts in the conversation library were coded for gender of interactant, type of relationship (platonic, romantic, family, or mixed), relationship size type (dyad, triad, or group), and number of interactants per conversation. In terms of the demographic characteristics of the sample (N = 213 interactants), 109 (51.2%) were males and 104 (48.8%) were females. For groups (dyads, triads, and groups of 4 or more), 38 (59.4%) were mixed gender, 15 (23.4%) were male only groups, and 11 (17.2%) were female only groups. Table 1 shows the relationship between gender and relationship size in the conversation library sample. A Pearson chi-square test failed to find any statistically significant difference between these groups ($\chi^2(2) = 1.08$, $p = .584$).

**Table 1**
*Gender of Interaction Participants by Relationship Size*

| Gender | Relationship Size | | | |
|--------|------|-------|-------|-------|
| | Dyad | Triad | Group | Total |
| Male | 29 | 12 | 68 | 109 |
| Female | 31 | 15 | 58 | 104 |
| Total | 60 | 27 | 126 | 213 |

Likewise, chi-square test failed to find any statistically significant difference between type of relationship and gender in the sample ($\chi^2(3) = 2.37$, $p = .499$). Table 2 below displays the frequencies of participants by gender and relationship type.

**Table 2**

*Gender of Interaction Participants by Type of Relationship*

| | Type of Relationship | | | | |
|---|---|---|---|---|---|
| Gender | Platonic | Romantic | Family | Mixed | Total |
| Male | 84 | 10 | 10 | 5 | 109 |
| Female | 73 | 10 | 11 | 10 | 104 |
| Total | 157 | 20 | 21 | 15 | 213 |

Two test whether differences existed between groups of interactants based on whether the recording device was directly and explicitly referenced in the course of the recorded conversation, transcriptions were coded as recorder "addressed" or "non-addressed". Of the 64 recorded conversations, 46 (71.9%) did not address the recording device directly, whereas 18 (28.1%) did address the recording device directly. A Pearson chi-square test failed to find any statistically significant difference between type of episode (addressed and non-addressed) and gender in the sample ($\chi^2(1) = 0.47$, $p = .493$). Table 3 below displays the frequencies of participants by gender and episode type.

**Table 3**

*Gender of Participants by Addressed or Non-Addressed Group*

| | Group | | |
|---|---|---|---|
| Gender | Addressed | Non-addressed | Total |
| Male | 34 | 75 | 109 |
| Female | 28 | 76 | 104 |
| Total | 62 | 151 | 213 |

To answer the third research question, turns at talk were coded for all individuals and grouped by addressed or non-addressed. The ratio of turns of talk for each individual was calculated by dividing the turns at talk for the individual within each episode by the total turns at talk for all individuals in that episode. This method of comparing ratios of turns of talk between groups is analogous to the methods employed to determine whether there was a "Hawthorne" effect on video-taped physician consultations conducted by Pringle and Stewart-Evans (1990). Comparisons of these ratios by gender and grouping are discussed below. All other statistical outcomes are provided in Appendix B.

## Results

To determine whether there is a statistically significant difference in the ratio of turns at talk between segments in which the recording device is directly addressed and segments of talk in which the recording device is not directly addressed, a series of comparisons of means were conducted. For all tests, no statistically significant difference was found episodes were the

recording device was not directly addressed and segments where the recording device was directly addressed. These results seem to confirm the conclusions reached in examining the conversational data using ethnomethodological techniques.

An independent samples *t*-test was utilized to determine if the ratio of non-addressed episodic turns (M = .30, *sd* = .16, n = 151) differed from the ratio of addressed segment turns (M = .29, *sd* = .19, n = 62). Independent samples *t*-test failed to find any significant difference between these ratios ($t(211) = -0.88$, $p = .378$, $\omega^2 = -.001$).

A repeated measures ANOVA was utilized to determine if the ratio of turns that did not contain a reference to the recording device (M = .29, *sd* = .17) differed significantly from the ratio of addressed segment turns (M = .29, *sd* = .19) within the same groups (n = 62). Tests of between group differences failed to meet significance. Likewise, a repeated measures ANOVA was utilized to determine if the ratio of turns which did not contain a reference to the recording device differed significantly from the ratio of addressed segment turns by gender within the same groups (n = 62). Tests of between group differences failed to find any significant difference between the ratio of participant turns in non-addressed episode (Males: M = .28, *sd* = .17, n = 34; Females: M = .30, *sd* = .16, n = 28) and the ratio of participant turns in addressed segment (Males: M = .28, *sd* = .19, n = 34; Females: M = .30, *sd* = .19, n = 28).

## Limitations

The sample of recorded conversations was collected through combination of convenience and snowball techniques. Students at three different institutions were given extra credit to participate in naturalistic conversational data collection, and were asked to record these conversations with family and friends. All participants were provided with a short description of the study and the nature of their participation. The recorded conversations were initially transcribed by the students and were returned with the tape recordings as well as signed informed consent forms for study participation by all subjects.

At the time of data collection, the purpose of the data collection was to build a conversation library for conversation analysis and ethnomethodological research. With these methods, sampling is not a relevant consideration, as most investigations proceed at the micro-level with a single segment of interaction serving as the unit of analysis for an entire study. Regardless of the sampling limitations, the resultant sample fairly well represents the study population of interacts within this language group. Put another way, ethnomethodological approaches are interested in uncovering the common elements of human behaviors that are rule-governed and fairly stable (see Schegloff & Sacks, 1973). Future investigations may try to control for possible sample bias by means of more probability-based sampling techniques at the outset.

## Conclusion and Directions for Future Study

In general, these findings strongly suggest that the knowledge of and even direct orientation toward a recording device does not affect the outcome, provided the question of interest to the

researcher is properly framed. In this case, the question of interest involved highly structured, mundane everyday conversational behaviors. Both humanistic and social scientific evidence in this study demonstrate that there is no "Hawthorne" effect with pervasive, habituated behaviors in natural settings. Although the debate on the "Hawthorne" effect has existed in the academy for the majority of the 20th century, recent studies seem to suggest the effect is overstated. Indeed, Wickström and Bendix (2000) posited that the "Hawthorne" effect is often cited in research as a possible explanation for results supporting a hypothesis.

Academic debates will continue. Critics may argue that the study did not account for possible changes in "what" the participants say, only on possible changes in "how" they say. Although this study focused on pragmatic behaviors, and not on content of conversations per se, evidence in the conversation library suggests that even content might not be affected by orientation to the recording device. In excerpt (4) above, orientation to the recording device did not "change" participants' proclivity to use taboo language. More directly, several segments of conversation in the conversation library included references to criminal behavior. As the excerpt (5) below shows, the participants indicated they knew they were being recorded while they were discussing criminal behavior.

> (5)[6] Platonic group (MY95009)
> ```
> 223    Mg:    S((***)) let's smoke it
> 224    Sh:    All right!
> 225    L:     I was like "come on let's all get high!"
> 226    J:     Well you're not going to save it?
> 227    Sh:    Well I'm not going to smoke it right here right now
> 228    Mk:    Let's smoke it!
> 229    Sh:    Yeah I'm going to save it
> 230    D:     Who cares what it is let's smoke it!
> 231    Sh:    What did he say?
> 232    Mk:    He's taping this and he said
> 233           who cares what it is let's smoke it
> 234    Sh:    Why is he taping our conversation?
> 235    Sc:    I'm doing it for extra credit
> 236    D:     Oh you're seriously taping that
> 237           Oh shit!
> 238    Mg:    Is that guy the one who goes free forum area
> 239           and starts dancing in for all those groups
> 240    Sh:    Wait what?
> ```

In this excerpt, turn-taking still occurs. Even if D: (in lines 236-237) implies uncomfortableness with the existence of a recording device given the content of the conversation, a) D: still expresses an utterance, thus taking a turn; b) D: states an awareness that what was discussed was recorded; and c) the conversation continues after the explicitly stated awareness.

In another example, participants directly address the researcher requesting the recording in the course of the conversation, continuing the conversation after explicitly addressing the issues related to recording. The segment addressing the researcher begins with line 40 and continues through line 51. The conversation continues when M returns through to line 191 when the subject of addressing M's teacher (the researcher) is brought back into the conversation.

> (6)[7] Platonic group (MY95019)
> ```
> 040    M:     Keep on talkin'
> 041    J:     No.
> ```

```
042    M:    And don't say bad stuff about my teacher ((exits room))
043    L:    Oh, say bad stuff about your teacher, Okay
044          ((Laughter))
045    J:    Man, this is a stupid ass project
046          M((***))'s teacher is a big dick
047          ((Laughter))
048    L:    Yeah, M((***)) was right about this ass, hee hee
049          ((Laughter))
050    J:    What the hell kinda class is that anyway?
051          Interpersonal Communication

191    J:    You might wanna let it run a little longer
192          in case you wanna cut out the part
193          when I was swearin' at your teacher
194          ((Laughter))
195    M:    When were you swearin' at my teacher?
196    J:    When you were in the bathroom
197    M:    Aw, maybe I'll cut that out
198    L:    No, you gotta record everything
```

As with the previous excerpt, the interactants do not appear to alter the content of the conversation even when explicitly addressing the recording. Both excerpts (5 and 6) seem to negate the argument that content might be affected by the knowledge of, and orientation to, the recording device. In fact, Coombs and Smith (2003) argue that knowledge of an interaction with the researcher might actually benefit the research endeavor.

The current study only examined one characteristic of everyday talk: turn-taking. To extend and make stronger the argument that utilizing a recording device does not provide a hindrance to researchers investigating human interaction in natural settings, other qualities of talk can be coded for statistical analysis. To be sure, the subdiscipline of social interaction studies utilizing ethnomethodological approaches, including conversation analysis, is mature. A casual reading of the topics covered in a famous text on the subject (see Nofsinger, 1991), demonstrates a significant number of qualities of talk that have been thoroughly examined. For example, one possible phenomenon for future investigation using the mixed method approach of the current study might be adjacency pairing, such as question-answer or demand-response.

For scholars interested in the relational effects of conversational moves, comparisons of these features of talk between members of relationships can be examined. As in the current study, demographic information of participants can be used to determine if differences exist between groups on various features of talk. For example, LeBlanc (1996) used conversation analysis to examine conversational features that served to disconfirm the relationship or relational other. Thus, these disconfirming conversational acts may be coded and analyzed for potential differences between groups.

Early conversational research examined the paralinguistic cues in everyday talk through careful transcription of features including pauses, overlaps, interruptions, and speech acts utilizing audiotaped conversations. Paralinguistic cues are available to the listener. However, other nonverbal behaviors, such as eye contact, gaze, and body language are not accessible through sound, and may only be accessible through sight. Certainly all nonverbal behavior potential impacts the meaning of a message. Along those lines, Frauendorfer, Mast, Nguyen, and Gatica-

Perez (2014) offer suggestions for future research utilizing new technological tools to assist in transcribing and coding these behaviors. Given these possibilities, the future looks bright for this line of research.

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## About the Author

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[1] The special notation used in the conversational excerpts is taken from the transcription system developed by Gail Jefferson for conversation analysis (see J. M. Atkinson and J. Heritage (Eds.). (1984). *Structures of Social Action: Studies in Conversation Analysis,* (pp. ix-xvii). London: Cambridge University.

[2] Excerpted transcript (HPLCL DC94014) is taken from a romantic mixed-gender dyad.

[3] Excerpted transcript (HPLCL DC94001) is taken from a platonic mixed-gender group.

[4] Excerpted transcript (HPLCL DC94018) is taken from a romantic mixed-gender dyad.

[5] Excerpted transcript (HPLCL MY95013) is taken from a platonic mixed-gender group.

[6] Excerpted transcript (HPLCL MY95009) is taken from a platonic mixed-gender group.

[7] Excerpted transcript (HPLCL MY95013) is taken from a platonic male group.