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Interactional challenges for non-native speakers of English in emergency telephone calls

Abstract

This paper investigates interactional challenges experienced in calls to emergency services with native English speaking (NS) call takers and non-native speaking (NNS) callers. Case studies of three problematic NNS/NS calls from a collection of emergency service calls were conducted using a conversation analytic approach. These calls were selected from publicly available recordings which were made by callers who were hearably NNS of English. The analysis shows how accents, grammatical and other linguistic choices led to related challenges in the pragmatics of communication (including procedures for sequential organization such as adjacency pairs, repair initiation, confirmation requests, presequences and story solicits). Routine procedures for repair or confirmation can produce hidden disjunctures and/or inaccurate or missing information as a result of the NNS/NS issues in the interaction. These challenges may contribute to failures of intersubjective understanding in the calls, affect

the accuracy of information obtained, and extend the length of the call, which may impact the successful provision of emergency services to NNS callers.

Keywords: Emergency service telephone calls, Non-native speakers, Conversation analysis, Repair, Sequential organization

1. Introduction

Public services, including emergency services, may not be equally accessible by all if language differences or non-native speaker (NNS) status complicate the public's interactions with the organizations that provide them. The purpose of this paper is to discover how NNS of English callers and native speaker (NS) call takers manage interactional challenges experienced while doing the work of requesting and providing help during emergency service calls.

The conversation analytic method is well-suited to the study of emergency service calls because it enables direct examination of the actions taken by participants in their interactional context so that their orientation to each other's actions can be observed. Previous conversation analytic studies of emergency service calls (911 in the United States) have investigated the interactional organization of the calls (e.g., Kevoe-Feldman, 2019; Kevoe-Feldman and Pomerantz, 2018; Larsen, 2013; Monzoni, 2009; Paoletti, 2009, 2012; Tracy and Tracy, 1998; Whalen and Zimmerman, 1990; Zimmerman, 1984). Studies have investigated the opening sequences of this type of institutional talk (e.g., Cromdal et al., 2012a, b; Zimmerman, 1984, 1992a), the formulation of the caller's

first turn (e.g., Riou et al., 2018; Whalen and Zimmerman, 1990), and the construction of the interrogative series of questions to obtain information from the caller and verify that help is warranted (Whalen and Zimmerman, 1987, 1990; Zimmerman, 1984; see also Garcia, 2015; Larsen, 2013; Riou et al., 2018). While callers may occasionally assume that receiving help is a given (e.g., Whalen, Zimmerman and Whalen, 1988; see also Paoletti, 2009; Zimmerman, 1992b); most callers display an orientation to the need to justify their request for service (Whalen and Zimmerman, 1990; see also Cromdal et al., 2008; Gerwing and Indseth, 2016; Sharrock and Turner, 1978; Tracy and Anderson, 1999). Research has also investigated how locations are communicated (Paoletti, 2012), and how call takers respond to caller's expression of emotions and work to facilitate the transmission of information when caller's emotional display interferes with communication (Whalen and Zimmerman, 1998).

While previous conversation analytic studies have investigated many aspects of emergency service calls, relatively few conversation analytic studies have addressed calls with NNS callers and NS call takers. This previous research falls into three categories, (1) studies of how the choice of language used in the call is managed (e.g., by providing translators), (2) simulation studies which focus on particular interactional techniques used in NNS/NS calls, and (3) case studies of naturally occurring calls which analyze the interactional techniques used to achieve and repair intersubjective understanding between NNS/NS participants.

1.1. Studies of how the language to be used in the call is managed. Some studies address how the language spoken in the call is negotiated or managed when

there is a language difference between caller and call taker. Raymond's (2014) article examined NNS callers who requested translation services. He found that some used English to request a Spanish-speaking call taker, while others simply persisted in speaking Spanish, thus implicitly requesting translation services through their inability to accommodate the English-speaking call taker. Some of the call takers quickly transferred the caller to a Spanish-speaking call taker, but in other cases the call takers resisted the implicit or explicit request for a translator, for example by repeatedly asking the caller whether they spoke English (Raymond, 2014).

Penn et al. (2017) studied emergency service calls in a country with multiple languages (South Africa). While many of the call takers in their data were multilingual and were able to switch to the caller's preferred language, these shifts did not always proceed unproblematically. The official language of the call center was English, but problems were observed with callers speaking isiXhosa that did not occur with callers speaking Afrikaans. Translators were at times provided for speakers of both languages, but they found that the accommodation of isiXhosa speakers' language preferences were more complicated. When NNS callers do not have the assistance of a bilingual call taker or translator there may be challenges related to the language differences between the participants (e.g., Gerwing and Indseth, 2016; Svennevig, 2012).

1.2. Simulation studies which focus on particular interactional techniques. While conversation-analytic studies typically rely on naturally occurring data, simulation studies of emergency interactions have produced interactional data that was then analyzed from a conversation analytic perspective (e.g., Gerwing and Indseth, 2016;

Svennevig et al., 2019). In a role play study which simulated emergency telephone call interactions with NSs giving first aid instructions to NNS, NSs were assigned the task of instructing NNSs how to correctly position a doll (representing a patient) into a recovery position. Svennevig et al. (2019) found that NSs playing the role of instructors used lexical substitutions (replacing technical terms with more common terms), reformulations (rephrasing and/or repeating parts of the instructions to make them easier to comprehend), “left-dislocation” (beginning with a key word to aid understanding, and then repeating that word in the explanation), and decompositions (breaking the full instruction into shorter segments).

A simulation study using conversation analysis to study medical emergency service calls in Norway recruited immigrants with varying degrees of familiarity with Norwegian or English to participate in role plays with call takers who spoke both languages (Gerwing and Indseth, 2016). The immigrants role playing callers spoke a first language other than Norwegian or English. The authors studied three-part sequences which began with an informing by the NNS caller, followed by either a confirmation of understanding or indication of trouble by the NS call taker (e.g., a request to repeat). The third turn in the sequence was produced by the caller in response to the call taker’s “uptake” of their informing. Caller’s accents and vocabulary limitations made their turns difficult for the call takers to understand (Gerwing and Indseth, 2016).

In both the Svennevig et al. (2019) and the Gerwing and Indseth (2016) studies the simulated role play interactions did not necessarily replicate the nature of an actual emergency call. Naturally occurring emergency calls are made during or shortly after

an urgent, often ongoing situation. In the Svennevig et al. (2019) study the callers had time to prepare scenarios for the role plays in advance, and the call takers were prepared to answer calls from NNS callers. In addition to using simulated role plays rather than naturally occurring data, the Gerwing and Indseth (2016) analysis focused on the three-turn sequences involving responses to information conveyed rather than analyzing the entire call as the interactional context for the exchange of turns within it. These aspects of their study leave open the question of how naturally occurring NNS calls are handled by call takers.

1.3. Case studies of naturally occurring NNS/NS emergency calls. Case studies are useful to analyze the interactional techniques used to achieve and repair intersubjective understanding between NNS/NS participants, in particular where problems emerge in the call. Svennevig (2012) conducts a single case analysis of a Norwegian NNS/NS emergency service call that was not successful in getting help to the patient in time. The NS call taker answered a call from an immigrant who was a NNS of Norwegian. Svennevig (2012) showed how the call taker's failure to successfully manage the call led to a tragic delay in service. For instance, she showed that the call taker's focus on getting the information needed to send help (e.g., location details) conflicted with the caller's expectations for speedy responses to the urgent situation they were describing, and thereby led to an escalation of conflict. Three additional calls were made in an attempt to get help for the ill person, each of which led to conflict.

A single case analysis of the interactional procedures used in a Swedish emergency service call with a NNS caller and a NS call taker showed that the participants used routine interactional techniques to prevent misunderstandings and to repair them when they occurred (Osvaldsson et al., 2012). The techniques used included confirmation checks, repair moves, and reformulations to avoid or quickly repair any misunderstandings that emerged.

The NNS caller in their data at times used questioning intonation when providing information, thus soliciting confirmation from the call taker that the information conveyed was understood. Similarly, the call taker used questioning intonation when reformulating the caller's utterances to solicit confirmation that they understood the caller correctly (Osvaldsson et al., 2012; see also Svennevig et al., 2019). At times the call taker used partial repeats or reformulations of the caller's informings without questioning intonation; in these instances they displayed their understanding of the caller's turn so that the caller could correct them if necessary. These methods were typically successful in the call studied by Osvaldsson et al. (2012).

When misunderstandings did occur, Osvaldsson et al. (2012) found that the call taker used routine procedures for accomplishing other-initiation of repair (Schegloff et al., 1977). She worked to elicit clarification of points that may not have been precisely communicated by the NNS caller, whether due to problems with grammar, vocabulary, pronunciation, or other issues. The call taker sometimes performed self repair of her own utterances by reformulating them with more accessible terminology or phrasing, thus displaying an orientation to the NNS caller's level of facility with the language.

In short, the techniques used by the participants in Osvaldsson et al. (2012) do not differ from the types of techniques that might be used to repair misunderstandings or create intersubjective understanding in calls with two native speakers. However, the need for their use may arise much more frequently in NNS/NS calls than in NS/NS calls. In addition, the consequences of failures of intersubjective understanding may be greater in the context of emergency service calls than in an ordinary conversation. As will be shown in the analysis below, these repair and confirmation check techniques are not always successful in the calls studied in this paper.

In sum, the conversation analytic research on emergency telephone calls reviewed above addressed issues such as how participants resolved which language was to be used in the call (Penn et al., 2017; Raymond, 2014) and how participants in the calls avoided and resolved misunderstandings due to language difference through such techniques as confirmation checks and repair work (Osvaldsson et al., 2012; Svennevig, 2012). Some of the studies were simulation role play studies (e.g., Gerwing and Indseth, 2016; Svennevig et al., 2019); these types of studies may not sufficiently duplicate the experience of participants in naturally occurring emergency service calls. In naturally occurring calls NS call takers do not know in advance that they are dealing with NNS callers and NNS callers do not have time to prepare what they are going to say.

The current paper builds on previous research by analyzing a small collection of naturally occurring English language NNS/NS emergency service calls. I use a conversation analytic approach and show how communicative challenges due to accents, linguistic choices, differences in terminology (see Gerwing and Indseth, 2016; Lev-Ari and Keysar, 2010; Svennevig, 2012), and related challenges in the pragmatics

of communication (including procedures for sequential organization such as preference organization, repair, contiguity, pre-sequences and story solicits) may contribute to failures of intersubjective understanding or other problems in the call. I will show that in some cases the findings of previous studies were supported by this analysis, but in other instances the interactional procedures used were not successful. These findings have implications for the accuracy of the information obtained and the length of the call, both of which may impact the successful and timely delivery of emergency services.

This paper describes the data and methods, analyzes the data, and concludes with a summary and discussion of the findings. I also discuss implications for our understanding of how intersubjective understanding is obtained and maintained during NS/NNS emergency telephone calls, and implications for practical methods of training call takers to better manage communication issues and provide better service for NNS callers.

2. Data and methods

In this paper I apply conversation analysis to a collection of emergency service telephone calls; this method enables the direct observation of participants' actions in interactional context (e.g., Heritage and Clayman, 2010). Any troubles in talk that may be related to the caller's NNS status will not only be directly observable, but the call taker's orientation to these actions will be displayed in their responses.

The data analyzed in this paper are part of a larger collection of 96 calls collected for a study of interactional procedures in emergency service calls (see Sidnell (2010) on collections of conversation analytic data). The calls were publicly released to the media by

a range of 911 call centers throughout the United States and were located through newspaper articles or other media accounts. These calls were pre-existing public records and hence were exempt from human subjects review.

The calls were transcribed using the conventions of conversation analysis (Jefferson, 2004a). It should be noted that the speech of the NNS callers was at times very difficult to understand and transcribe. It should not be assumed that just because I was able to transcribe their talk (only after repeatedly listening to the calls) that it would be reasonable to expect the call takers to immediately understand all of the caller's speech with only one hearing.

The data collection procedures did not provide an opportunity for surveying participants about their NS/NNS English status. While the skill levels of NNS vary greatly, NNS with very weak English skills may choose not to call 911 and instead may have someone else call for them, or may request a translator (e.g., Ong et al., 2012; Raymond, 2014; Tate, 2015). At the other end of the skill spectrum, NNS with very strong English skills may be undetectable as NNS by the call taker as well as by this analyst. The callers who are therefore relevant for this analysis are those who fall within the middle of this spectrum of competence with English--those who are "hearably" NNS, for example due to noticeable accent, vocabulary and/or grammatical differences, but are willing and able to participate in the call without an interpreter's assistance.

In this collection of 96 calls there were only 8 calls with callers who sounded like NNS of English. All 96 of the call takers in the collection sound like NS, as do 92% of the callers. In some of these 8 NNS/NS calls, other than slight accents there were few signs of interactional challenges due to the language ability of the participants. In this

paper I analyze three calls in which the NNSs actions in the call were significant enough to cause challenges in the calls.

The first two NNS/NS emergency service calls analyzed in this paper were related to the Boston Marathon bombing. A few days after the bombing, the two suspects held up a man who had stopped his car at the side of the road and made him ride with them as they drove around. When they stopped for gas he ran away to the minimart of the gas station across the street and asked the shop clerk for help. The NNS shop clerk called 911 and spoke to the NS call taker on his behalf. At the request of the call taker he then gave the phone to the NNS man whose car was stolen, who also spoke to the 911 call taker. The third call is from an unrelated event that took place a few years later in which a NNS called emergency services because his pregnant wife began to give birth as they were driving to the hospital. The analysis that follows shows how participants in NNS/NS calls work to discover, avoid and repair interactional challenges and misunderstandings that occur between them.

3. Interactional challenges in NNS/NS emergency service calls

As the research summarized above has shown, in the context of emergency telephone calls, callers have a different role in the interaction than call takers. They need to understand the types of information required and what actions call takers and callers should take at different points in the call (e.g., in the opening sequence and the interrogative series). They must also utilize routine interactional procedures for repair, resolving interruptions, providing answers in response to questions, providing confirmation, and so forth. In the analysis below I will show how the NNS status of the

callers in these three calls contributed to misunderstandings and other challenges in the call. For example, the caller's accents, grammar and vocabulary, and their use of routine procedures for sequential organization at times made it challenging for the NS call takers to understand what they were saying or to successfully accomplish repair moves. These challenges increased the interactional work necessary to achieve intersubjective understanding. Among the consequences of these types of challenges are potential delays of provision of services, transmission of inaccurate information, and failure to transmit important information which may be consequential for the callers, the police or others.

3.1 Call 1: The shop clerk's 911 call

The NNS caller in the first call was a shop clerk at a gas station minimart. There were several misunderstandings in this call which are related to the caller's NNS status. Problems included misfitting responses to questions, misinterpretation of an address term attention solicit, and misinterpretation of a presequence initiator as an informational question. First, the NNS caller's noticeable accent is evident in his first turn (Excerpt 1, line 5), thus likely identifying him to the call taker as a non-native speaker of English. Second, the caller's first turn also displays some grammatical differences from Standard American English. For example, the caller says "yeah u:h I am uh in mobih gehs station?" (line 5), omitting the definite article "the" prior to the word "mobih" ("Mobil"). Later on in the call, he uses the infinitive form of the verb "to leave" in line 32, saying "he won't to (to) leave" instead of "he won't leave." Third, at several points the caller uses a narrower range of vocabulary than would typically be available

to a native speaker of English. For example, in line 21 he says “I have one! e:h come (eh) came inside now”, using “one” to refer to the individual rather than a categorical noun such as “man” or “customer.” He also says “came inside” (line 21) instead of something like “came in the store” or “came in.” These aspects of the caller's language production intersect with interactional procedures in ways which lead to some challenges in the call:

Excerpt 1 Call 1: Clerk calls 911 for driver whose car was stolen

1 CT: nine one one (recorded line) what's [thuh nature] of your

2 ?: [()]

3 CT: emergency?

4 (0.3)

5 C: yeah u:h I am uh in mobih gehs station? (0.6) u:h (eh-) eight

6 sixteen memoral dr:ive? (0.4) and [I] have one uh

7 CT: [()]

8 CT: sir?

9 (0.2)

10 C: eight sixteen mem- me- memorial dr:ive

11 CT: correct (I need is there any) apartment number sir?

12 (0.6)

13 C: no eight sixteen.

14 (0.2)

15 CT: .h I understa:nd eight sixteen memorial drive is thee [address]

- 16 C: [thuh mobiw]
- 17 thuh mobiw gas station
- 18 (0.2)
- 19 CT: thuh mobil gas station
- 20 (0.2)
- 21 C: yeah. (0.3) I have one! e:h come (eh) came inside now and (he to'd
- 22 me) some wa:::h one (uh) wanted to shoot heem and he stay(ed) inside
- 23 and he won't: leave.
- 24 (5.5)
- 25 CT: so this is at memorial drive [(at thuh)] gas station correct?
- 26 C: [yeah]
- 27 (0.3)
- 28 C: yeah, (0.2) okay sir?
- 29 (0.2)
- 30 CT: is thuh gentleman there?
- 31 (0.2)
- 32 C: yeah. (.2) [(he's inside)] he won't to (to) leave thuh gehs station
- 33 CT: [(can I-)]
- 34 (0.2)
- 35 CT: I know. can I speak with him
- 36 (0.6)
- 37 C: yeah >gih(v)e me one second<
- 38 (0.7)

The caller's first turn begins, as is typical for 911 callers, with a brief acknowledgment of the call taker's opening turn ("yeah u:h; line 5) (Zimmerman, 1984). However, the continuation of this turn, although in general appropriate for a 911 caller's first turn (he provides his location), does not answer the call taker's opening question ("what's [thuh nature] of your emergency?"; lines 1 and 3). The fact that the caller did not immediately state the problem as requested, along with the caller's accent and the grammatical issues noted above (lines 5-6), likely alerted the call taker to the NNS status of the caller and may have reduced comprehensibility of the caller's first turn. Rather than initiating repair of the missing answer to his question, the call taker waits for the caller to complete his opening turn.

The caller provides his location in a two-part turn. A strategy of simplifying turns and breaking them into smaller increments in NNS/NS interactions was also found in Gerwing and Indseth (2016) and Svennevig (2019). Note that in the first part of this turn the caller uses questioning intonation and then pauses ("I am uh in mobih gehs station? (0.6)"; line 5). The caller thus solicits the call taker's confirmation through the questioning intonation, and leaves space for the call taker to initiate repair during the pause. When the call taker does not respond, the caller continues providing the location, now moving on to the address ("u:h (eh-) eight sixteen memoral dr:ive? (0.4)"; lines 5-6). Note that the caller uses the same format for this part of his turn, providing the location information and using questioning intonation as a confirmation solicit followed by a pause. When the call taker does not respond, the caller displays his orientation to the address as not problematic by initiating his description of the problem

("and [I] have one uh", line 6). The call taker briefly interrupts this turn beginning (line 7) but immediately drops out.

The call taker then interjects at a point where the caller's utterance is not hearably complete, using an address term with questioning intonation to solicit the caller's attention ("sir?"; line 8). The caller treats this summons as a repair initiator rather than as an address term, and responds by repeating the address ("eight sixteen mem- me- memorial drive"; line 10) (Schegloff et al., 1977). The call taker first acknowledges the address ("correct"; line 11), but then asks for an apartment number: "(I need is there any) apartment number sir?" (line 11). While call takers are trained to get specific information about the location of the caller (such as this request for an apartment number), this caller has already identified himself as being in the (Mobil) gas station. The call taker's request for an apartment number thus reveals that he did not understand the first part of the caller's first turn ("I am uh in mobih gehs station?", line 5).

The caller attempts to correct the call taker's misunderstanding by first saying "no" in response to the question as to whether there is any apartment number, and then repeating the address a third time (line 13). At this point the call taker again conveys that he has heard the address ("h I understa:nd eight sixteen memorial drive is thee [address"; line 15). The caller overlaps this turn to reissue the precise location "[[thuh mobiw] thuh mobiw gas station" (lines 16-17). Note that the caller repeats the words "thuh mobiw" that was first produced in overlap with the prior turn. By repeating this information in the clear he works to ensure that the call taker can hear it (Jefferson, 2004b; see also Schegloff, 1987; Vatanen, 2014, 2018). The call taker then repeats this

information ("thuh mobil gas station"; line 19), thus displaying that he now understands the caller is in the gas station rather than in an apartment at that address (Osvaldsson et al., 2012). After a brief pause the caller confirms this as a correct understanding of his location ("yeah"; line 21). This is an example of a successful repair/confirmation sequence, however it differs from the repair work found by Osvaldsson (2012) in that the call taker does not use questioning intonation to solicit a confirmation from the caller. The extended repair work outlined above was required to correct the call taker's mishearing of the caller's initial report of his location.

The caller next returns to describing the problem he is calling about (lines 21-23), an action he had abandoned earlier due to the call taker's intervention regarding the location. The caller's description of the problem is produced with a noticeable accent as well as some grammatical and word choice issues which may reduce the comprehensibility of his turn. However, he successfully conveys the following important elements:

- (a) The identity of the person affected ("I have one! e:h come (eh) came inside now"; line 21).
- (b) His "stance" relative to the events described ("he to'd me"; lines 21-22; Garcia and Parmer, 1999; Whalen and Zimmerman, 1990; Zimmerman, 1984).
- (c) That the problem warrants police attention ("some o::ne one (uh) wanted to shoot him"; line 22).

The call taker displays an orientation to the adequacy of this description of the problem by not initiating repair (he may be entering the information into his computer during the lengthy pause in line 24). However, rather than moving to closing by stating

that help is on the way (Raymond and Zimmerman, 2016; Zimmerman, 1984), the call taker opens up the topic of the location again in line 25, repeating the location and ending with a confirmation solicit ("correct?"). This suggests that the call taker is not convinced of his comprehension of the caller's communications. The limitations of the caller's English ability, displayed in his description of the problem in lines 21-23, may warrant this concern.

After the participants have again confirmed their shared understanding of the location of the problem (lines 25-28), the caller says "okay sir?" (line 27). While this use of "okay" could introduce a transition to a next topic (Barske, 2009), the caller's intonation suggests that it is closing-implicative--the caller is checking to see if the call can move to closing (Button, 1987; Schegloff and Sacks, 1973). The call taker indicates he is not ready to move to closing by asking a question ("is thuh gentleman there?"; line 30). This is a yes or no question (Heritage and Clayman, 2010), and is formulated with a preference for a "yes" answer (Pomerantz, 1984; Sacks, 1987). The caller's response begins with "yeah" (line 32). This part of his response treats the call taker's question as an informational question about the location of the victim. However, at this juncture in the call, "is thuh gentleman there?" is also hearable as a pre-request--a preliminary action projecting the performance of a request; this utterance therefore initiates a presequence (Schegloff, 1979). The caller does not display an orientation to this question as a presequence. Instead of offering to bring the "gentleman" to the phone, the caller repeats information he had provided earlier ("[(he's inside)] he won't to (to) leave thuh gehs station"; line 32). The caller seems to not understand that the call taker wants to speak with the man, instead interpreting the question as indicating the call

taker has not heard or understood what he said earlier. The call taker then confirms his understanding of what the caller has said (“I know”; line 35), followed by “can I speak with him”; thus displaying that his previous question was a pre-request. This more direct formulation of the request is successful; the caller responds “yeah >gih(v)e me one second<”; line 37), and gives the phone to the man whose car was stolen.

In sum, by using routine interactional procedures such as repeats, confirmation solicits, and repair moves, the parties eventually achieve intersubjective understanding and accomplish the work of the call in spite of the NNS caller's issues with the language and failures of comprehension at several points in the call. However, in spite of the caller's interactional competence with the structure of emergency service calls and pragmatics of interaction such as questions/answers, repair, and confirmation, there were several misunderstandings which suggest that the caller's comprehension of the call taker's utterances (and at times vice versa) was only partial.

For example, the caller provides a location instead of a description of the nature of the emergency in his opening turn, seems to mishear an address term/attention solicit (“sir?”) as an other-repair initiator, and misinterprets a pre-request to speak with the victim as an informational question rather than the initiator of a presequence. Two thirds of the turns talk in this call (10 out of 16) involved some type of problems and/or the repair work needed to correct them. The various miscommunications and subsequent repairs that occurred due to the NNS/NS status of the participants increased the length of the call and may have delayed the provision of help.

3.2 Call 2: The driver's 911 call

The shop clerk gives the phone to the man who has asked for help, and this man now speaks to the same 911 call taker. This second caller is also a NNS of English, and has a noticeable accent which makes it difficult to understand his speech. This caller wanted help because he had been car jacked at gun point, but he also had extremely important information to communicate about the people who had stolen his car and briefly kidnapped him. They were the Boston Marathon bombers, who at that time were still on the run. Unfortunately, due to problems in the call due to the caller's NNS status, the call taker was not able to understand this information which could have led to the police apprehending the suspects sooner than they did.

During the opening sequence the caller made several pleas for help and communicated that someone had taken his car (not shown). The call taker worked to help him calm down so that he could answer questions (Whalen and Zimmerman, 1998). As Excerpt 2 begins, the call taker initiates the interrogative series (“tell me what happened.”; line 20) and displays that he has understood the information the caller has given so far (“somebody took your car?”; line 20). Given the preference for contiguity, when two first pair parts are produced in one turn, the recipient typically answers the second question first, and then may respond to the first (Sacks, 1987). In this case, the second question (“somebody took your car?”) has a preference for a “yes” answer (Pomerantz, 1984; Sacks, 1987). The caller produces a preferred response to this second question (“.h yeh(s) .hh hh [(.hh hh)]”; line 22), but instead of then answering the first question by telling what happened, he can be heard audibly breathing, indicating more emotional upset (Whalen and Zimmerman, 1998). As in the first call, where the shop clerk appeared to hear a pre-request as an informational question

(Excerpt 1 above), the caller in Excerpt 2 may interpret the call taker's question in line 20 as an informational question or request for confirmation rather than as a story solicit-a request for a recounting or description of what happened (Goodwin, 1984). While the caller apparently understands English well enough to understand the type of utterance being produced (e.g., that it was a question), in this instance he did not display an orientation to the sequential work being done by the story solicit or to understand the work being done by this type of request in the context of a 911 call (Whalen et al., 1988).

Excerpt 2: Call 2 Driver reports car stolen

- 20 CT: tell me what happened. somebody took your car?
- 21 (0.2)
- 22 C2: .h yeh(s) .hh hh [(.hh hh)]
- 23 CT: [and] wuh- what happened when they took
- 24 (their) car
- 25 (0.3)
- 26 C2: they (say that they) are duh (.) .h dey dey they (dih thuh) .h ixplo:sion?
- 27 ma rah thon ixplosion! they are (moh- mechanism)
- 28 (0.3)
- 29 CT: they they what?
- 30 C2: they they are thuh .hh (thuh (b)akers of thuh) .h (0.2) marathon
- 31 explosion hh .h hh[hh]
- 32 CT: [the]y're thee ah- eh sir! what did he say when

dey they (dih thuh) .h ixplo:sion? ma rah thon ixplosion! they are (moh- mechanism)” (lines 26-27).

As Sacks (1984a) noted, there are "ordinary" places in an interaction to tell a story, and placing it in an unusual position typically requires an account or explanation for its disjunctive placement. The caller has a legitimate and urgent reason for communicating the identity of the suspects as early as possible in the call (since he knows that they are the Boston Marathon bombers, who were the subject of a statewide search at that point). However, his disjunctive placement of this critical information here instead of providing the story of what happened requested by the call taker may contribute to the call taker's failure to comprehend what he is saying.

The call taker then initiates an other-repair of the caller's response (“they they what?”; line 29), thus displaying his failure to understand what the caller has said in lines 26-27. Not only does he not understand the salient details of the caller's turn (e.g., “ma rah thon ixplosion!”; line 27), he also apparently fails to understand that the caller is producing an *identifier* of the suspects rather than a *description* of what they did (note the call taker asks “they they what?” rather than “they they who?”). The call taker persists in trying to elicit a “what happened” telling from the caller, in short, a response to his prior requests in lines 20 and 23-24.

The caller's response to this repair initiation is to repeat the information already provided in lines 26-27. He says “they they are thuh .hh (thuh (b)akers of thuh) .h (0.2) marathon explosion hh .h hh[hh]” (lines 30-31). This turn is hard to understand due to the caller's accent, and the call taker again fails to comprehend what the caller is trying to communicate. In addition to the challenges created by the caller's accent, there are

challenges due to the mismatch in sequential organization--the misfit between the call taker's questions and the responses provided by the caller.

In response, the call taker first appears to initiate a turn about the suspects (“[the]y’re thee ah-”; line 32). The call taker initiates a self-repair (Jefferson, 1974), cutting himself off mid-turn and abandoning this apparent attempt to paraphrase what the caller has said. He then produces a third reformulation of his question, still on the theme of discovering what happened (“eh sir! what did he say when he took your car”; lines 32-3). However, the caller’s response is again not a second pair part to the question that was asked. Instead, the caller makes another plea for help and provides additional information to emphasize the seriousness of the situation (“.hh hh please hehp hehp me please they have guns! hh .hh hh=”; lines 35-36). A disjunctive plea for help is consistent with a caller experiencing emotional upset (Whalen and Zimmerman, 1998).

Instead of trying to repair the lack of fit between his question and the caller’s answer, the call taker asks a follow up question about the suspects (“=where are they?”; line 37). The caller’s answer to this question (“.hh they are een thuh hh (0.2) (here) gash station. in memowial drive”; line 39) functions as an adjacency pair second pair part--the answer fits with the question that was asked. The call taker asks a follow-up question to clarify where exactly the suspects are (“they’re in front of thuh gas station?” (line 41). This question has a preference for a “yes” response, which the caller quickly provides (“yehs.”; line 43) and then immediately adds “I just ruhn I just ruhn I just cou'd ruhn .hh hh=” (line 43). The caller is now telling “what happened”, but in a disjointed way rather than in the form of a story or coherent description of events. According to

media reports, when the suspects stopped at one gas station, the caller escaped and ran across the street into the minimart of the Mobil gas station (Globe Staff, 2015).

In sum, there are a range of challenges related to the NNS/NS status of the participants that affected intersubjective understanding and may have increased the length of the call. First, the caller's accent, grammatical and word choice issues made it challenging for the call taker to understand the caller. Second, the sequential organization of the call differed from routine emergency service calls in several ways (including failing to provide responsive answers to questions in the opening and the interrogative series, producing misfitting responses to questions, interpreting a story solicit as an informational question, and producing isolated informings instead of a coherent story describing what happened). While the many repairs lengthened the call and therefore may have delayed the delivery of services, it is also consequential that the police may have missed a potential chance to capture the Marathon bombers due to the call taker's inability to understand the information the caller was giving him about the suspects.

3.3 Call 3: Man helps wife deliver baby

This call was placed by a NNS caller whose pregnant wife started delivering as he was driving her to the hospital. There are several ways in which the caller's accent, intonation patterns and vocabulary choices, along with both party's difficulty comprehending each other's utterances, lengthened the call and inaccurately conveyed critically important information. Three excerpts from this seven minute long call will be used to illustrate some of the types of problems that occurred.

Excerpt 3 begins with the opening of the call. First, as in the call discussed in Excerpt 1 above, there is a misfit between the call taker's opening question and the caller's response. While the call taker asks "where is your emergency<" (line 1), the caller provides a description of the problem ("h_i: uh my wi:fe uh del_iber right now I don' know how to do it. ((staccato intonation))"; lines 3-4). The NNS's accent, intonation, pacing and stress patterns make comprehension of this turn challenging. In addition, linguistic choices such as "my wi:fe uh del_iber" (line 3) instead of, for example, "my wife is delivering" or "my wife is in labor" may also make it difficult for the call taker to understand the nature of the problem. The caller's continuation of his turn in line 3 with "right now" suggest he is aware that inaccurate verb conjugations may fail to convey the temporality of the verb "deliver", however this addition leaves open the question as to whether his wife has just delivered or is currently delivering. The caller then adds "I don' know how to do it" as a statement of the problem or an indirect request for help. In the context of this utterance the referent of "it" may be problematic. There is some evidence in the call taker's response ("=what's happened?"; line 5) that he had difficulty interpreting the caller's first turn:

Excerpt 3: Call 3 Man helps wife deliver baby

- 1 CT: >nine one one (line recorded) where is your emergency<
 2 (0.8)
 3 C: h_i: uh my wi:fe uh del_iber right now I don' know how to do it. ((staccato
 4 intonation)) (we)=
 5 CT: =what's happened? (0.1)

- 6 C: we try to- we try to get to duh hospital! my
 7 wife deliber
 8 (0.6)
 9 CT: (your [your)
 10 C: [baby ([)]
 11 CT: [okay okay] okay, (0.1) your wi[fe's i]n la:bor?
 12 C?: [(yeah)]
 13 (0.6)
 14 C: yesh.
 15 (0.2)
 16 CT: and thuh ba:by came out?
 17 (0.6)
 18 C: yesh:.

Call takers often ask a general question such as "what's the problem there" (e.g., Whalen et al., 1988) to elicit a statement of the problem when one has not been volunteered by the caller. However, in this case the call taker's "what's happened?" in line 5 conveys the call taker's inability to understand the caller rather than a routine inquiry to initiate the interrogative series. Here it functions as an other-repair initiator; a request for repetition or clarification of the caller's prior turn (Schegloff et al., 1977). The caller's response starting in line 6 suggests he is trying to explain "what's happened?". He starts with "we try to- we try to get to duh hospital!" Again, the verb tenses are potentially problematic here. It is not clear that this story is about what has

happened, what the caller is currently doing, or what he plans to do. The caller then repeats part of his first turn ("my wife deliber"; lines 6-7). After a brief pause the call taker responds. The call taker's turn is overlapped by the caller's next turn in line 10 and the call taker briefly drops out. The turn the caller has begun in line 10 begins with "baby"; the rest of the turn is inaudible because it occurs in overlap with the call taker's turn. The call taker seems to provide a candidate reformulation of the caller's story beginning with "your [your" (line 9), and (after the overlap, which the call taker ends with "[okay okay] okay,"), "your wi[fe's i]n la:bor?" (line 11). The call taker thus reformulates the gist of the caller's prior turns. He uses "in la:bor?" instead of "deliver", perhaps because the caller's accent made it difficult to comprehend that word. As Gerwing and Indseth (2016) found, participants in NNS/NS interactions often simplified vocabulary or restated/reformulated turns with different words in order to display and request confirmation of their understanding. The questioning intonation at the end of line 11 works to solicit confirmation from the caller (Osvaldsson et al., 2012). The caller provides confirmation of the call taker's understanding of "what's happened" in line 14. After receiving the confirmation, the call taker reformulates the caller's last turn (line 10) which was partially inaudible because it was produced in overlap. The call taker asks "and thuh ba:by came out?" (line 16). This reformulation was also produced with questioning intonation, and is another initiated repair--a request for clarification. The caller again confirms the call taker's understanding ("yesh."; line 18).

However, we learn later in the call that the baby has not yet been born (as we will see below, it is born during the call). The exchange in lines 16-18 therefore creates a "hidden disjuncture" in which the participants fail to understand each other, but do not

realize that they do not understand each other (Garcia and Parmer, 1999; see also Gerwing and Indseth, 2016) on “undetected misunderstandings” in emergency phone calls). Verb conjugations are often challenging for NNS, and it could be that the caller could not distinguish between “came out” (something that has already happened) and “coming out” (something that is in progress). This example illustrates that even when the routine procedures for repairing or confirming intersubjective understanding are used, they are not necessarily successful.

Specialized terminology or jargon terms can also challenge NNS/NS interactions and contribute to misunderstandings (e.g., Cooke et al., 2000). Excerpt 4 from the same call illustrates terminology-related comprehension problems that require repair:

Excerpt 4: Call 3 Man helps wife deliver baby

(Caller "C" male; Call Taker "CT" male; Call Taker 2 (in background) "CT2"; male)

- 164 C: how long (is thee [])
- 165 CT: [alright is thee] is thee umbilical where is
- 166 thee umbilical cord
- 167 (0.5)
- 168 C: hanh?
- 169 (0.6)
- 170 CT: where's thee uh umbilical cord
- 171 CT2: >minivan< ((overheard--call taker 2 speaking to someone on another line))
- 172 (0.2)
- 173 CT: do you see thuh cord? theh- thuh co:rd out of thuh belly button

174 where's thuh cord out of thuh belly button
175 (0.2)
176 C yeah thuh cord (is) come out
177 (0.8)
178 CT: what's that?
179 (1.2)
180 C: (thuh cord is come out)

In Excerpt 4 the caller fails to understand the term “umbilical cord” in the call taker’s question in lines 165-66. The caller initiates an other-repair in line 168 (“hanh?”). The call taker responds by repeating the question (“where’s thee uh umbilical cord”; line 170). After an unrelated comment by another dispatcher talking to someone on a different line (CT2, “>minivan<”; line 171), the call taker makes a third attempt to get a response to his question about the umbilical cord. This time he maintains the word "cord" but replaces the term “umbilical” with a descriptive identifier (“out of thuh belly button”; lines 173-4). The caller displays his understanding of this reformulation by responding “yeah thuh cord (is) come out” (line 176). The caller's use of "thuh cord" (line 176) is an instance of format tying (repeating terms or phrases from a prior speaker’s turn which can work to display comprehension--Goodwin and Goodwin, 1987).

Osvaldsson et al. (2012) found that the call taker in their data used repeats of the NNS caller’s utterances as a way of verifying their comprehension. The call taker took the absence of the caller’s correction of the repeat as verification that the call taker had

it right. In Excerpt 5 the call taker uses the same technique but it is not always successful because the caller's responses are at times contradictory. While at first the caller claims the baby is breathing, he later states that he is not breathing. The call taker must work to repair these unresolved disjunctures (Clayman, 1985).

Excerpt 5: Man helps wife deliver baby

- 197 CT: okay? (0.2) so=
 199 C: =()=
 200 CT: =is it wrapped around thuh baby's neck any more?
 201 C: no! no [no]
 202 CT: [it-] it's not? is thuh baby breathing eh- or crying or
 203 anything?=
 204 C: =^oyep^o yep
 205 (0.1)
 206 CT: so it is crying? thuh baby's cryin'?
 207 (0.4)
 208 C: ye:p ((sounds of whimpering in background))
 209 CT: Okahy. so thuh baby is crying right?
 210 (0.7)
 211 C: thuh baby come out but >I don't know< I don't know if he is u:h-
 212 breath(ing) or not
 213 (0.3)
 214 CT: okahy. is he cry:ing or anything?

215 (0.3)

216 C: no.

217 (0.2)

218 CT: thuh baby's not crying or anything like that=

219 C: =^ono^o (no)=

In response to the call taker's queries, the caller asserts twice that the baby is breathing (lines 204 and 208). However, when the call taker repeats his query a third time (line 209) he receives a different response. This time the caller says "thuh baby come out but >I don't know< I don't know if he is u:h- breath(ing) or not" (lines 211-212), thus directly contradicting the responses he has just given in lines 204 and 208. Upon receiving the information that the baby may not be breathing, the call taker again works to verify whether the baby is breathing or not, this time asking "okahy. is he cry:ing or anything?"; line 214).

The caller responds with an emphatic "no." (line 216), which contradicts the information he had given several times previously. The call taker makes yet another attempt to verify the unresolved disjuncture (Clayman, 1985) between the caller's varying answers ("thuh baby's not crying or anything like that="; line 218), and receives a second denial ("=^ono^o (no)="; line 218). This denial is consistent with the caller's most recent prior response in line 216. The call taker then guides the caller through CPR and the baby quickly begins breathing (not shown).

These unresolved disjunctures retrospectively justify the call taker's practice of repeating his queries several times to make sure he has the correct answer to his

questions, even when the caller has provided confirmatory responses. Taken together they illustrate that the call taker in this NNS/NS call can not rely on confirmation checks to verify the accuracy of information.

In sum, some of the challenges in this call were due to difficulty understanding the caller's accent, along with problems related to grammar, verb conjugations or word choices. The call taker used other-initiation of repair, repeats and reformulations as comprehension checks and to restore intersubjectivity when necessary. However, there were contradictory responses at several points in the call, some creating disjunctures in the caller's responses to questions, and at least one hidden disjuncture. These challenges and their repair lengthened the call, and also introduced inaccurate information (such as conveying that the baby had been born when it had not yet been and first claiming the baby was breathing and later contradicting that information). The extra time needed to attain and repair intersubjective understanding due to the NNS/NS communication issues in this call and recurring ambiguity about what the caller's responses meant have clearly lengthened the call. Even more critically, without the call taker's skepticism of the caller's confirmatory responses which led him to pursue repeated checks on the accuracy of the information he was being given, risk to the baby could have occurred.

4. Discussion and conclusions

The NNS/NS calls analyzed in this paper exhibited several types of communicative challenges related to language difference. First, the participants at times had difficulty understanding each other due issues such as accent, pronunciation, intonation,

grammar or word choice. Second, the NNS status of callers may impact their ability to successfully execute the pragmatics of communication during the call. For example, language comprehension challenges may make it hard to track the work done through routine actions such as comprehension checks, repair initiations, and procedures for sequential organization (such as preference organization, requests, and story solicits). In these data the problems that emerged included hidden disjunctures that were the result of repair/confirmation sequences that failed to reveal the misunderstanding between the parties, misfitting responses to call taker's questions, misinterpretation of an address term attention solicit, and misinterpretation of presequences as informational questions rather than as a prerequisite or a story solicit. When one's facility with a language is limited, it is harder to discern and conform to those aspects of communication, because they often depend on subtleties of language and its production. In short, the problems caused by NNS status were not caused solely or primarily by the language problems themselves (such as accent, grammar and word choice), but in how they problematized or disabled the pragmatics of communication--the interactional procedures used to interact with others.

In all three calls analyzed above, interactional challenges related to NNS/NS status lengthened the calls and therefore potentially delayed delivery of services. In addition, in the second and third calls these interactional challenges did not always result in accurate information being conveyed. In the second call, the caller told the call taker that the men who had taken his car and kidnapped him were the Boston Marathon bombers. Because the call taker did not understand this information, an opportunity to apprehend the suspects was missed. In the third call the caller's contradictory answers

to questions led to inaccurate information being transmitted (the caller initially said the baby was breathing when it was not). The call taker had noticed inconsistencies in the caller's turns throughout the call (such as first saying the baby had been born and then later revealing it had not yet been born). He therefore repeated confirmation checks multiple times in an attempt to verify their accuracy; these repeated checks ultimately revealed that the baby was in fact not breathing. These hidden disjunctures retrospectively justified the call taker's practice of repeating his confirmation requests and checks several times to make sure he received the correct answer to his questions, even when the caller has already provided confirmatory responses. His skepticism was justified; if these contradictory responses had not been expeditiously resolved the baby's life could have been at risk.

There were similarities and differences in the findings of this paper and previous research on NNS/NS calls regarding repair and confirmation procedures. Unlike the Svennevig (2012) call, there was no evidence of conflict between the parties in the three calls analyzed here. While in the Osvaldsson et al. (2012) analysis, repair procedures and confirmation checks/solicits were found to be effective, in these data they were not always successful in achieving intersubjective understanding. Hidden disjunctures, contradictory or inaccurate results at times resulted from these routine procedures for repairing or confirming intersubjective understanding. Taken together they illustrate that the call taker in this NNS/NS call can not rely on confirmation checks to verify the accuracy of information. The findings of the current paper therefore suggest that NS call takers should not rely on repeating or reformulating a NNS caller's prior turn to display their understanding of the utterance or to solicit the caller's confirmation, with or

without questioning intonation. Call takers interacting with NNS callers must make judgment calls about when to rely on repair and confirmation check procedures, and when to doubt their accuracy. Further research should investigate the extent to which repair and confirmation procedures may be disabled in these calls and how call takers can minimize the risk of not detecting inaccurate information.

In the simulation study conducted by Gerwing and Indseth (2016) an example of a misfitting response to a question in a NNS/NS role played call shows a call taker asking a "what's the problem" type question and the caller responding with the location of the problem. In the current study, in the two calls that began with an opening sequence (call 1, made by the shop clerk and call 3, made by the man helping his wife deliver), the caller's first turn was not responsive to the call taker's opening question. In call 1 the call taker's "what's the nature of the emergency" query was followed by the caller providing a location, and in call 3 the call taker's "what's the location" query was followed by the caller's description of the problem. While neither call taker pursued an answer to their opening question, it is possible that the misfitting response contributed to the call taker's struggles to understand the caller's first turn in the third call, or to hear the caller's information about the Mobil gas station in their first turn in the first call.

In all three of these instances the call takers "went with" the direction taken by the callers rather than pursuing an answer to their opening question. In the Gerwing and Indseth (2016) example, since it was a role play, the participants knew the caller would be a NNS and therefore may well have responded differently than if it were a naturally occurring emergency phone call. This suggests an avenue of further research to see how common this type of misfitting caller's first turn is in NNS/NS calls. In all

three of these cases the choice to pivot to the caller's approach seems to have worked well. A systematic study of NNS/NS call openings should be conducted to determine whether this type of mismatch is more common in NNS/NS calls than in NS/NS calls and whether pivoting to the caller's response instead of repairing the misfitting response is an effective way to handle it. These pivots seem to suggest that the call takers are able to identify the callers as NNS and adjust their responses accordingly after a very small amount of talk has been produced. Call takers should be taught to identify NNS quickly and have a set of strategies for interacting with these speakers that may differ from the strategies they use for interacting with NS callers.

Ideally this further research should be conducted with naturally occurring emergency service calls rather than simulation studies or role plays. In naturally occurring emergency service calls the callers do not have time to rehearse and are responding to genuine emergencies, which is not the case in simulation studies. In order to determine the frequency and impact of misfitting responses to call taker's opening questions, as well as exploring the problems with inconsistent effectiveness of the repair and confirmation check procedures discussed above, naturally occurring data will be more useful.

These findings help illuminate how NNS callers may experience difficulties getting help from emergency services that NS do not. Learning how to improve these interactions is an important step in improving access to services from these organizations. Increasing call takers' familiarity with how NNS with different first languages communicate could better prepare them to accommodate for, repair, or avoid many of the challenges that occurred in these calls. For example, familiarity with a NNS

caller's accent, even if one does not know how to speak that specific language, can increase one's ability to understand a NNS caller. Call taker training could include exposure to and interactions with persons with various accents common in the community being served so call takers can become more facile at hearing and understanding what they are saying. Further, familiarity with the need to simplify vocabulary choices or verb forms, along with instruction in the basic differences between English and the most common languages the call taker would likely be receiving calls from, may help them anticipate problems in understanding and preemptively simplify or adjust their language in ways that could be helpful to the NNS caller. The expertise of teachers of English as a Second Language (ESL) could be called upon to broaden the training 911 call takers receive in these areas.

It is also likely that potential callers with no English or very poor English may choose not to call 911 at all, or may have someone else call on their behalf, so the calls most likely to be compromised by NNS/NS differences are likely not included in this collection of data. Designing 911 call systems so those who need translation services can get them would be helpful to many NNS callers. A national 911 translation service might be warranted, so that non-English speakers anywhere in the country could call or text and request a translator in their native language. While in some locations translation services are available (e.g., see Meische et al., 2010; Penn et al., 2017; Raymond, 2014; Showstack, 2019; Tate et al., 2016), they may not always be sufficient or easy to access. Another suggestion would be to hire more bilingual call takers so that at least the most common languages in the area covered by a 911 call center would have access to a native speaking call taker.

Since this study is based on a relatively small data set, conclusions and practice recommendations about NNS-NS emergency telephone calls drawn from this analysis must be tentative. Further research should examine the range and frequency of these types of problems in naturally occurring emergency service calls with NNS/NS participants in a larger data set.

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