Hijacking the dispatch protocol: when callers pre-empt their reason-for-the-call in emergency calls about cardiac arrest

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Abstract

This paper examines emergency ambulance calls made by lay callers for patients found to be in cardiac arrest when the paramedics arrived. Using conversation analysis, we explored the trajectories of calls in which the caller, before being asked by the call-taker, said why they were calling, i.e., calls in which callers pre-empted a reason-for-the-call. Caller pre-emption can be disruptive when call-takers first need to obtain an address and telephone number. Pre-emptions have further implications when call-takers reach the stage when they are required to deliver the scripted turn "*tell me exactly what happened*". When there has been a pre-emption earlier on, callers tend to treat the scripted turn as a request for more information and may not repeat their reason-for-the-call. This can occasion delays and important information can be lost. We identified an effective alternative strategy used by some call-takers, pre-emption repeat, which callers treat as a request of confirmation.

Keywords

Introduction

In private telephone conversations, callers may provide a reason for making the call (Schegloff and Sacks, 1973), a turn which has come to be known as the "reason-for-the-call". In (1), Yvonne is the caller and she provides a reason-for-the-call l.6, in what (Schegloff, 1986) called a pre-emption, as she does not return Bonnie's greeting in the how-are-you sequence initiated l.5.

> **(1) Example #26. (248a), reproduced from Schegloff (1986: 142)**
> ```
>        1    Bonnie: Hello?
>        2    Yvonne: Bonnie?,
>        3    Bonnie: Yeah.
>        4    Yvonne: It's Yvonne.
>        5    Bonnie: ·hh Hi, =
>   →    6    Yvonne: = I wanned to apologize to you for (0.6) Sunday . . .
> ```

While in private telephone calls providing a reason-for-the-call is not a mandatory step, institutional calls place a stronger emphasis on this turn. Emergency calls in particular are crucially structured around the reason-for-the-call, as one of the main objectives of the call is to identify the reason why assistance is required (Zimmerman, 1992). This monofocal orientation is directly connected to what Wakin and Zimmerman (2010) reported as reduction and specialisation in emergency calls.

In the specific case of medical emergencies, the reason-for-the-call is critical to identify the nature and seriousness of the situation. Depending on the caller's answers to a series of questions to assess the patient's condition (the "interrogative series", Zimmerman, 1992), the call-taker can identify a "chief complaint" and send appropriate help, as well as provide first aid instructions to the caller. In this paper, we focus on medical emergency calls processed by the call centre of St John Ambulance Western Australia (SJA-WA). To handle calls, SJA-WA uses a dispatch protocol called the Medical Priority Dispatch System® (MPDS, version 12.1.3, (Priority Dispatch Corp., 2008), a system used in 3,000 call centres worldwide[1] to rationalise the assessment of emergencies and prioritise calls. The overall structure of calls processed with the MPDS can be found in Figure 1. The dispatch protocol constrains the sequential structure of calls, as call-takers are required to follow a specific script containing questions and instructions for callers. Following their scripted dispatch protocol, call-takers' opening turn typically interlocks a categorical identification of the service and a request to provide the address of the emergency ("*ambulance what's the exact address of the emergency?*"). The initial focus on the address enables the Emergency Medical Services (EMS) to dispatch an ambulance as soon as the urgency of the situation is recognised. This means that callers are not asked to say why they are calling until later in the call. Call-takers then deliver the scripted turn "*okay tell me exactly what happened*". Where relevant, we integrated into our transcripts what call-takers entered in a text field called "problem description" (based on the callers' response). In our previous study on the MPDS (Riou et al., 2017a), we analysed the reason-for-the-call sequence itself. Our results suggested that when call-takers changed the tense of the verb *happen* from the simple past (*what happened*) to the present perfect

(*what's happened*), callers were more likely to shape their reason-for-the-call as a short report, rather than a narrative which could contain irrelevant details and thus waste precious time. However, this does not directly address the many cases of callers who do not wait to be asked what the reason-for-the-call is.

Figure 1. Dispatch protocol steps with the Medical Priority Dispatch System
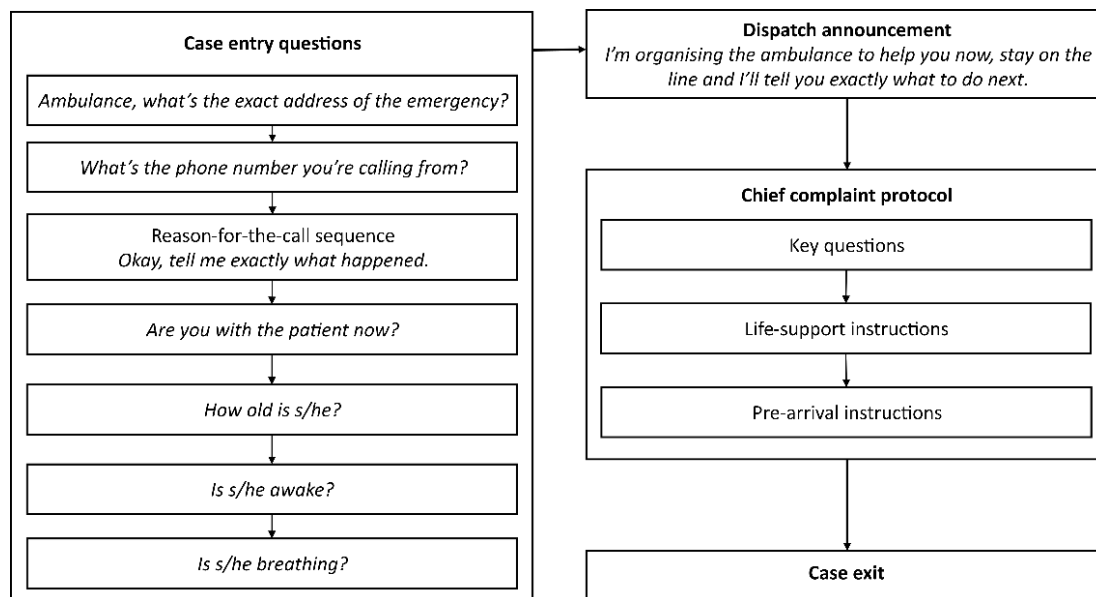
To date, conversation-analytic literature on emergency calls has mostly focused on call centres which require call-takers' first turn to contain a categorical identifier and an invitation for the caller to provide a reason-for-the-call, such as "*911 what is your emergency?*" in the United-States (Zimmerman, 1992), "*SOS One One Two, what has occurred?*" in Sweden (Cromdal et al., 2012) or openings such as "*This is medical service Sharon speaking what's your emergency?*" in South Africa (Penn et al., 2016). The fact that dispatch systems such as the MPDS do not immediately address the reason-for-the-call shapes the trajectory of calls in a number of very important ways. While many callers readily attend to the matters of confirming an address and telephone number, others attempt to provide a reason-for-the-call early in the call anyway, before being asked about it. A typical example can be seen in (2). In this extract, the call-taker (CT)'s question about the address (l.3) is followed by the caller (C)'s reason-for-the-call rather than an address (l.4-5). The transcription conventions can be found in the appendix.

(2) "foaming at the mouth" (SJA496)

```
         1    CT:      (.) ambulance,
         2             what's the address of the emergency.
→        3    C:       (.) u:m my boyfriend is there now a:nd he's foaming at the
                       mouth.
         4             [I don't know what's the matter with him. ]
         5    CT:      [WHAT's the address we're                 ] coming to.
         6    C:       ((ADDRESS)).
```

3

CT repeats the question about the address (l.5) in overlap with C's turn (l.4) and with strong emphasis on the word "what", effectively interrupting the caller who then provides her address (l.6).

Call-takers are required to adhere strictly to the dispatch protocol, and so they cannot change the meaning or order of their scripted turns. As such, the call-takers' institutional agenda means that they cannot let callers open the reason-for-the-call sequence before the address and telephone number sequences are completed. However, pre-emption of the reason-for-the-call is a phenomenon which *does* occur in the calls, and so it is important to know how to manage it. Firstly, call-takers have to find ways to deal with pre-emptions as they arise, typically in the address sequence. Secondly, the fact that callers pre-empt a reason-for-the-call reverberates later in the call, when call-takers eventually open the "official" reason-for-the-call sequence. If the caller has already said why they are calling, then it cannot be reasonably assumed that the project of defining a reason-for-the-call is a blank slate. Yet, the dispatch protocol encourages call-takers to deliver the scripted turn "*okay tell me exactly what happened*", regardless of what was said earlier in the call.

This paper analyses how callers' pre-emption of a reason-for-the-call shapes the trajectory of emergency calls. Our focus is on two sequential environments: 1) at the moment of pre-emption, i.e. when call-takers want to attend to something else than the reason-for-the-call, and 2) during the reason-for-the-call sequence, i.e. when call-takers reach the protocol step when they are supposed to officially request a reason-for-the-call. With quality and efficiency of dispatch in mind, this paper identifies an apparently effective strategy that some call-takers use, which we call "pre-emption repeat", and by which call-takers integrate caller pre-emption to the reason-for-the-call sequence. This strategy has the potential to be more effective for extracting the required information from the caller within the shortest possible time frame. As discussed below, time is a critical factor for patient survival.

Background

This paper focuses on emergency calls made for patients who were found to be in cardiac arrest when the paramedics arrived. In cardiac arrest, the heart suddenly stops pumping and the patient becomes unconscious, with no pulse and no normal breathing. Without prompt intervention, the patient will die. Out-of-hospital cardiac arrest (OHCA) is the ultimate time-critical emergency for EMS: survival rate declines by 5.5% for every minute without treatment, such as cardio-pulmonary resuscitation (CPR) or the use of an external automatic defibrillator (AED) (Larsen et al., 1993). The chance of survival is very low: in Perth, only 4% (628) of OHCA patients[2] attended by paramedics in 1997-2014 survived to hospital discharge (Beck et al., 2016). Recognising cardiac arrest during emergency calls (Viereck et al., 2017) and guiding callers through basic life support (CPR) until the paramedics arrive (Rea et al., 2001) is essential for good outcomes. In this "chain of survival", the first link is the call made by a bystander to the emergency telephone number (Cummins et al., 1991). Recent studies have started to argue that an interactional analysis of calls could contribute to improving the accuracy and efficiency of dispatch for OHCA (Clegg et al., 2014; Riou et al., 2017a).

From the point of view of callers, this does not mean that the reason-for-the-call they give is cardiac arrest per se. While some of the 200 callers in our corpus used words such as "dead" – the closest non-technical term to describe cardiac arrest – many callers presented a variety of other concerns such as that the patient had collapsed, was having a heart attack, or was having a seizure. It is the main responsibility of the call-taker to identify and classify the nature of the emergency. Within the version of the MPDS used in Western Australia, any patient found to be unconscious and not breathing is considered to be in cardiac arrest. However, not all cases of cardiac arrest are recognised during the emergency call. Insufficient assessment of the patient's breathing is one of the main barriers to the recognition of cardiac arrest during emergency calls (Dami et al., 2015).

Materials and Methods

We collected a corpus of 200 emergency calls for cardiac arrest received by SJA-WA between January 2014 and December 2015 in Perth, Western Australia. Criteria for call inclusion can be found in the published study protocol (Riou et al., 2017b). This paper focuses on the subset of 66 calls in which the caller pre-empted a reason-for-the-call. We excluded the calls in which callers made pre-emptions only to state the urgency of the situation ("*it's an absolute emergency please hurry*") without saying what the emergency was (9 calls). Among the 66 calls included, the call-taker recognised cardiac arrest in 40 cases and did not recognise it in 26 cases.

Immediate contingencies of pre-emptions

Pre-emption of a reason-for-the-call is a frequent practice of callers. In our corpus, it occurred in 33% (66/200) of calls. Pre-empted turns tended to share some properties with standard reason-for-the-call turns (in the reason-for-the-call sequence). In a similar way to answers to the scripted turn "*okay tell me exactly what happened*", pre-emptions routinely made explicit the social identity of the patient. Reasons-for-the-call typically contained a noun phrase referring to the patient and stating the relationship between the caller and the patient, for example saying "*I can't wake my husband up*". When callers did not know the patient personally, they also tended to express this absence of social relationship using an indefinite noun phrase, such as "*a guy's unconscious?*"

When the social identity of the patient appears in initial position, call-takers can project that the turn is going to be a reason-for-the-call (rather than an address or telephone number). Some call-takers interrupted callers as soon as they mentioned the patient or their relationship to them. In our corpus, 10 pre-emptions were interrupted by call-takers before callers could state a reason-for-the-call. Extract (3) is a representative example: the caller is about to say what the problem is with her mother (l.4-5), but she is interrupted by the call-taker (l.6) who recycles her previous turn about the address (l.2).

(3) "it's my mum" (SJA194)
```
1    CT:      ambulance.
2             ↑what is the address of the emergency.
```

```
    3   C:      oh hello.
→   4           um it's my MUM,
    5           ⌈she's-⌉
    6   CT:     ⌊what's⌋ the address of the emergency please.
```

In the 56 other cases of pre-emption, callers could complete at least one turn expressing a reason-for-the-call. In these cases, the pre-empted content contained either a tentative diagnostic ("*it's a heart attack*") or a symptom causing concern ("*a gentleman has collapsed*"). In (4), C is an elderly woman calling because her husband is not waking up. The call-taker opens the call with a categorical answer to the summons ("*ambulance*" l.1), immediately followed with a request for C's address (l.2). L.3 corresponds to the first turn allocated to C, and it is highly constrained by the call-taker's preceding question (projecting an answer). However, C does not provide her address in this position, but rather, refrains from presenting her situation as an emergency ("*I don't know whether it's an emergency*" l.3) and immediately delivers a second turn latched to her first one, presenting her concern ("*I can't wake my husband*" l.4).

(4) "can't wake my husband" (SJA117)
```
    1   CT:     (.) .h ambulance,
    2           what's the address of the emergency?
→   3   C:      (.) hi: I:- I don't know whether it's an emergency=
    4           =I can't wake my husband.
    5   CT:     okay.
    6           yes.
    7           what's your address?
    8   C:      (..)((STREET NUMBER))?
    9   CT:     ye:s?
    10  C:      ((STREET)),
    11  CT:     yes?
    12  C:      ⌈((SUBURB))⌉.
    13  CT:     ⌊and your⌋ phone- (.) your phone number ma'am.
    14  C:      (.) ((TELEPHONE NUMBER))?
    15  CT:     yes?
    16  C:      u:h uh,
    17          (.) ((TELEPHONE NUMBER)).
    18  CT:     yes?
    19  C:      ((TELEPHONE NUMBER)).
    20  CT:     h okay that matches.
⇒   21          so you can't wake up your husband.
    22  C:      no:,
    // Problem description entered by call-taker: "can't wake up husband" //
```

C thus uses her first turn to withhold her claim that she is calling about an emergency ("*I don't know whether it's an emergency*" l.3). It should be noted that even though C does not provide the expected answer to CT's question, she still links her turn to it. Indeed, the scripted first pair part of the address sequence ("*what's the address of the emergency?*") integrates the notion that any call received through an emergency number potentially requires assistance (Whalen and Zimmerman, 1987). In (4), C leaves it to CT to determine the urgency of her

situation, thereby clearly positioning herself as a citizen requiring public service rather than a customer requesting a service (Laforest, 2011; Tracy, 1997). But doing so also allows C to immediately state the reason why she is calling ("*I can't wake my husband*" l.4). C's turn l.3 can thus be interpreted as a pivot allowing her to move quickly from CT's question about the address, to stating the nature of her emergency. In this way, we can interpret C's two-turn move as a reason-for-the-call pre-emption.

The treatment that the call-taker reserves to the pre-emption in (4) is also quite interesting in itself, as it goes a long way towards establishing good rapport with the caller. That is, in some cases, call-takers react to pre-emptions by repeating the unanswered turn (here, it would consist in asking again about the address, directly after C's pre-emption, i.e. l.5). What is more, repeating the same sentence is the strategy advised within the MPDS (International Academy of Emergency Medical Dispatch, 2013) to deal with callers who do not answer for a variety of reasons such as being too distraught or distracted by co-occurring events. Instead, in (4), CT provides two tokens of acknowledgement ("*okay*" l.5, "*yes*" l.6) before recycling his non-answered question ("*what's your address?*" l.7). In (4), the call-taker skilfully adheres to the next stage of protocol, but adapts his phrasing to reflect that he integrated the information about the reason-for-the-call already provided by the caller. This can be essential, as Garcia (2015) demonstrated how disaffiliation between speakers can be fuelled by too strict adherence to the interrogative series, and Svennevig (2012) showed that callers can develop feelings of hostility when call-takers withhold tokens of acknowledgement.

In 19 calls (29%), the call-taker did not provide any token of receipt after the pre-empted reason-for-the-call. For example, in (5), C's reason-for-the-call is that she thinks her husband is dead, and she pre-empts it (l.4) immediately after the call-taker opens the address sequence (l.3).

(5) "my husband's just died" (SJA106)
```
    1   CT:      ambulance,
    2   C:       ⌈yes.            ⌉
    3   CT:      ⌊what's the ad⌋dress of the emergency,
→   4   C:       .h I think my husband's just DIED.
    5   CT:      what's the address.
    6   C:       ⌈((ADDRESS)).         ⌉
    7   CT:      ⌊yes (.) yes (.) yes ⌋
    8   C:       ⌈((SPELLS STREET-)) ⌉
    9   CT:      ⌊I've got it,       ⌋
 // Problem description entered by call-taker: "? husband dead" //
```

The call-taker does not provide any form of uptake in relation to the reason-for-the-call. Instead, she repeats her question about the address ("*what's the address*" l.5), but drops the prepositional phrase "of the emergency". This means that only the noun phrase "the address" remains in turn-final position, which in terms of information structure, corresponds to a position of focus (Lambrecht, 1994). However, this does not mean that the call-taker did not integrate the pre-emption. In fact, the system recorded that she typed the words "? husband dead" in the field called "problem description". The caller did not later repeat her concern

that the patient was deceased, which suggests that the call-taker heard and took into account the pre-empted reason-for-the-call. Yet, she did not demonstrate to the caller that she had done so.

While they are focused on the address and telephone sequence, it may be tempting for call-takers to overlook pre-emptions and treat them as interruptions – what we equate to a "hijacking" technique used by callers. However, callers seem to treat pre-emptions as being on record, and this can have an impact on dispatch accuracy. As Garcia (2015) argued, adhering too rigidly to the interrogative series (Zimmerman, 1992) can lead the call-taker to miss crucial information volunteered by the caller outside of the scripted question-answer sequences. An example can be seen in (6), in which the caller's pre-emption contained essential information. C is a young woman whose mother has collapsed in the bathroom. Her father (B) is also present and can be heard in the background (l.14).

(6) "she can't breathe" (SJA509)

```
    1              what is the adDRESS we're coming to.
    2    C:        uh ((ADDRESS)).
→   3              ((SNIFF)) and ⌈she can't breathe.⌉
    4    CT:                    ⌊((ADDRESS.))        ⌋
    5              and the phone number?
    6    C:        u:h ((TELEPHONE NUMBER)).
    7    CT:       okay.
    8              that matches thank you,
    9              ⌈can you tell me exactly what's happened? ⌉
    10   C:        ⌊%you gotta hurry I don't know              ⌋ what's wrong
                   with her,%
    11   CT:       what's happened.
    12   C:        .h she's just collapsed and she's making these funny
                   NOI:ses a:nd,
    13   B:        ((IN THE BACKGROUND)) having a seizure.
    14   C:        ⌈seizure.    ⌉
    15   CT:       ⌊and are you–⌋ are you– she's having a seizure.
    16   C:        yeah a bad one.
 // Problem description entered by call-taker: "collapsed/ seizure" //
```

C pre-empts her reason-for-the-call ("*she can't breathe*" l.3) immediately after giving her address (l.2). After callers provide their address, call-takers typically confirm it in third-turn position by repeating it, or by asking callers to repeat it. C's pre-emption occurs in the slot that CT was prepared to use for confirmation of the address, and so the two turns are said in overlap (l.3-4). It is impossible to know whether CT heard what C said in her pre-emption. However, it is most likely that she heard that C had said *something*, but did not pursue it in order to attend to the immediately relevant step of the dispatch protocol. Unfortunately, this crucial information about ineffective breathing was partly lost in the call. After being asked "*what's happened*" (l.9 and 11), C did not repeat this information and instead, provided extra details, focusing on the seizure that the patient was having and the "*funny noises*" (l.12) she was making. The call-taker entered the following problem description in the system: "collapsed/ seizure". As part of the interrogative series, call-takers ask callers whether the

patients are breathing, and, depending on the specific chief complaint protocol (see Figure 1), whether their breathing is normal. In this call, the question of whether the patient was breathing was reached a few seconds later, as shown in (7).

(7) "she can't breathe" continued (SJA509)

```
→   1   CT:     (.) is she BREAthing?
    2   C:      %u:h she's finding it hard to breathe%.
    3   CT:     but is she BREAthing.
    4   C:      yeah,
    5   CT:     (.) okay.
```

Determining whether the patient is breathing effectively is crucial to the recognition of cardiac arrest. Not asking whether the patient is breathing normally can lead to non-recognition of cardiac arrest (Berdowski et al., 2009). One of the challenges of breathing assessment is that a reflexive breathing pattern known as 'agonal breathing' can sometimes be observed in the first few minutes after cardiac arrest (Haouzi et al., 2010). Agonal breathing is not effective breathing. It can sound like gasping or gurgling, which is deceptive for lay callers, who often report the patient as breathing when this is not the case (Hauff et al., 2003). In (7), CT does not check the quality of the patient's breathing, despite C's indication that her mother is "*finding it hard to breathe*" (l.2). C's pre-emption was designed with a stronger epistemic claim ("*she can't breathe*") than her later assessment of the patient's breathing ("*she's finding it hard to breathe*"). If it had not gone unnoticed, C's pre-emption about breathing difficulties at the very beginning of the call could have raised alarm bells for the call-taker, and this could have ultimately led to a different trajectory. Instead, cardiac arrest was not recognised during the call, and so C was not instructed to start CPR while waiting for the ambulance. The patient did not survive.

Within the MPDS, calls start with the address sequence because this is the single most important piece of information needed: in the event that the call was disconnected, an ambulance could still be sent to the location of the incident[3]. When callers pre-empt a reason-for-the-call instead of providing their address, they interfere with the dispatch protocol. However, in this section, we argued that treating pre-emption as disruptive can create issues, causing crucial information to be lost. Furthermore, the effect that pre-emptions can have on the trajectory of calls is not limited to their immediate context, but can also echo later in the calls.

Further trajectories after pre-emptions

If call-takers read the official prompt "*okay tell me exactly what happened*" to callers who have *already* pre-empted a reason-for-the-call earlier in the call, callers rarely interpret it as an invitation to provide a reason-for-the-call. Instead, they tend to take it as a request to provide *more* details about the emergency. This is what happens in (8). Instead of providing her address l.3, C states her reason-for-the-call ("*my husband's just (.) uh collapsed*" l.3). The call-taker provides a token of acknowledgement ("*okay*" l.4) interrupting C, and repeats the address prompt l.5.

(8) "my husband's just collapsed" (SJA430)

```
     1    CT:      ambulance,
     2             (.) what's the address of the emergency.
→    3    C:       u:h well uh my husband's just (.) uh collapsed and I can't
                   ⌈u:h  ⌉
     4    CT:      ⌊okay.⌋
     5             what's the ad↑dress that we're coming to.
     6    C:       uh ((ADDRESS))?
     7    CT:      .h thank you,
     8             that matches our system,
     9             and what's the telephone number you're calling from.
    10    C:       u:h ((TELEPHONE NUMBER)).
    11    CT:      < <l> thank you that matches our system= >
→   12             < <h> =okay tell me eXACtly what happened. >
    13    C:       well (.) he- he hasn't been very well for wha-
    14    C:       < <h> he's got asthma very bad? >
    15    CT:      ⌈unhunh?       ⌉
    16    C:       ⌊and then he-⌋ then he got a- an (.) upset stomach?
    17             .h and I just went in (.) in (.) NOW a:nd
    18             (.) and he wa:s u:h (.) sort of ? ? sort of gone
                   unconscious,
    19             .h and (.) I can't wake him up.
    20    CT:      .h okay.
   // Problem description entered by call-taker: "unconscious" //
```

When the call-taker initiates the reason-for-the-call sequence, she does not deviate from the script ("*okay tell me exactly what happened*" l.12). In response, C launches into a multi-turn unit (l.13-19) in the form of a narrative providing several background details such as that the patient has not been well for a while (l.13), suffers from asthma (l.14) and an upset stomach (l.16), and the circumstances under which C realised he was unconscious (l.17-18). This is mostly irrelevant to the call-taker at this point in the dispatch protocol, and it does not provide her with much more information to determine a chief complaint than C's initial statement "*collapsed*" (l.3). But from C's perspective, providing this account is a reasonable interpretation as to what is required of her when being asked "exactly" what happened, given that she has already said her husband collapsed.

Another sign that callers interpret the prompt as an invitation for more details is that a number of callers respond by saying that they "don't know" – even though they have already said something in the pre-emption. As discussed by Lindström and Karlsson (2016) for doctor-patient interaction in Swedish, this apparent paradox of claiming no knowledge and yet expressing some knowledge suggests that speakers are expressing something more than just lack of knowledge. An example of these I-don't-know prefaces can be seen in (9). C is calling because her brother-in-law appears to have died during the night.

(9) "I don't know" (SJA107)

```
     1    CT:      ambulance
     2             ⌈what's the address of the emergency,⌉
     3    C:       ⌊he's he's out                      ⌋ there.
     4    CT:      hello:.
```

```
    5              (..) [hello:. ]
    6   C:             [I think ] that something- someone I think my brother-
                   in-law's uh (..) dead I think.
    7   CT:      o:kay.
    8            what's the address we're coming to ma'am.
                 ((15 LINES OMITTED))
    9   CT:      okay tell me eXAC:tly what's happened?
→   10  C:       (.) I don't know=
    11           =I wake up and my brother's asleep.
  // Problem description entered by call-taker: "I think my brother in law
  dead"//
```

Even though C provided a reason-for-the-call in her pre-emption l.6 ("*I think my brother-in-law's uh (..) dead I think*"), this is not what she says once the call-taker opens the reason-for-the-call sequence with the turn "*okay tell me eXAC:tly what's happened*" (l.9). Instead, C provides a non-answer response ("*I don't know*" l.10) which, compared to providing an answer, is a dispreferred action (Stivers and Robinson, 2006). The linguistic design of C's response displays additional characteristics of dispreferrence (Pomerantz, 1984), as it is delivered with a slight delay (but see Kendrick and Torreira, 2015) and contains an account for not providing an answer ("*I wake up and my brother's asleep*" l.10-11). Besides providing a non-response, "I don't know" can be interpreted as a knowledge disclaimer expressing an epistemic stance (Lindström et al., 2016): the inability to know what happened (epistemic access) and/or not having the rights to interpret it (epistemic primacy) (Stivers et al., 2011). C expresses that she is not in a position to give more details on "*exactly what's happened*", as she was asleep and only woke up to find her brother-in-law apparently deceased. The design of C's responsive turn thus retrospectively indicates the action she ascribed to CT's request (l.9). It suggests that C interpreted CT's turn (l.9) not as opening the reason-for-the-call sequence, but rather as requesting more information on what she had already said in her pre-emption.

Out of the 66 callers who had pre-empted a reason-for-the-call earlier on, 10 callers (15%) prefaced their response to the official prompt ("*okay tell me exactly what happened*") with "I don't know" or "dunno". By contrast, in the 134 calls without pre-emption, only 6 callers (4%) responded to "*okay tell me exactly what happened*" with an I-don't-know preface. The difference was found to be statistically significant (χ^2, p=0.02). This suggests that the action that callers ascribe to the turn "*okay tell me exactly what happened*" depends on what happened earlier in the call. The scripted turn is interpreted as opening the reason-for-the-call sequence if there has not been a pre-emption earlier on. Otherwise, they seem to interpret the turn "*okay tell me exactly what happened*" as a request to provide more details – something they are not always in a position to do so, and can signal it with an I-don't-know preface.

However, further details are not exactly what call-takers expect when they say "*okay tell me exactly what happened*". As part of the dispatch protocol, delivering this turn is one of the mandatory steps. There is some evidence suggesting that even when callers have pre-empted a reason-for-the-call, and even when call-takers have heard it, the latter still expect callers to

repeat it in the official reason-for-the-call sequence. A case in point can be seen in (10), a call about an elderly patient who collapsed.

(10)   "my husband fell over" (SJA101)

```
   1   CT:     ambulance,
   2           what's the address of the emergency?
   3   C:      ((STREET)).
   4   CT:     (.) in what ⌈suburb please.      ⌉
→  5   C:              ⌊uh my husband fell⌋ over.
   6           ⌈I'm getting no response ⌉
   7   CT:     ⌊sorry what suburb please⌋
   8   C:      in ((SUBURB)) ⌈sorry. ⌉
   9   CT:                  ⌊and-   ⌋ and that matches what I have=
  10           =and what is the phone number you are calling from?
  11   C:      u:h ((TELEPHONE NUMBER))?
  12   CT:     that matches what I have=
  13           =okay tell me eXACtly what happened?
  14   C:      u:h he went to the toilet.
  15           but he:'s-
  16   CT:     yes?
  17   C:      but NOW I can't get any-
  18           he's BREAthing,
  19           but he won't answer me.
→ 20   CT:     okay so you said ⌈he fell over?⌉
  21   C:                      ⌊he fell over.⌋
  22   CT:     he fell over?
  23           and ⌈not ans ⌉wering.
  24   C:         ⌊yes.    ⌋
  25   CT:     okay,
// Problem description entered by call-taker: "husband fell over & not
answering //
```

C pre-empts her reason-for-the-call during the address sequence ("*uh my husband fell over*" l.5). Later, during the official reason-for-the-call sequence, she provides new content, in the form of a narrative of how the incident occurred (l.14-19). CT treats the non-repeat of the pre-empted content as a repairable, by recycling C's pre-emptive turn, saying "*okay so you said he fell over*" (l.20). This suggests that CT was expecting C to repeat her reason-for-the-call in its standard sequential position, even though she already had access to the information. From the point of view of dispatch, it can be problematic when callers treat the turn "*okay tell me exactly what happened*" as a request for more information. The additional information callers provide is rarely useful at this point in the call. This is not surprising, as callers do not generally know what type of information is essential at different points in the call. The call-taking process is rationalised through a strict definition of the content and sequence of questions asked. Thus, all the relevant information that call-takers need to retrieve is going to be targeted with specific scripted questions. After the reason-for-the-call, call-takers need to establish 1) whether the caller is in immediate proximity to the patient, 2) how old the patient is, 3) whether the patient is conscious, and 4) whether the patient is breathing. A multi-turn response to "*okay tell me exactly what happened*" by a caller who has already pre-

empted a reason-for-the-call creates a delay in the dispatch protocol. This is especially true if the caller gives a delayed, mitigated, elaborated dispreferred response.

A strategy to absorb pre-emptions: the Pre-emption Repeat

An alternative strategy is sometimes used by call-takers. In 7 calls, call-takers deviated from the protocol and did not deliver the scripted turn "*okay tell me exactly what happened*". Instead, they recycled the reason-for-the-call which had been pre-empted by callers, as in (11).

```
    (11)        "so your husband's collapsed?" (SJA261)
     1    CT:     ambulance?
     2            what's the address of your emergency.
     3    C:      ? h ? h ((STREET NUMBER))?
     4            I don't know ((ADDRESS))=
     5            =my husband's just collapsed on the⌈floor. ⌉
     6    CT:                                         ⌊okay. ⌋
     7            alright.
     8            < <f> that's the address I have on the system. >
     9            now what's the phone number you're calling from.
    10    C:      ((TELEPHONE NUMBER))?
    11    CT:     ↑yeah?
    12            < <l> that's the number I have. >
→   13            < <h> so your husband's collapsed? >
    14    C:      yes love.
      // Problem description entered by call-taker: "collapsed" //
```

C pre-empts a reason-for-the-call ("*my husband's just collapsed on the floor*" l.5) in a turn latched to her responsive turn providing her address (l.4). After the address and telephone number sequences have been completed, CT recycles the caller's pre-empted turn to open the reason-for-the call sequence ("*so your husband's collapsed?*" l.13) instead of delivering the turn "*okay tell me exactly what happened*". C then produces a confirmation token ("*yes love*" l.14), showing that she treated CT's question as requesting confirmation rather than information.

Two main formats for pre-emption repeat can be found. Call-takers can preface their turn with the discourse marker *so*, as in the calls analysed above in (4) and (10), whose reason-for-the-call sequence is reproduced below in (12) and (13) respectively.

```
    (12)        "so you can't wake up your husband" (SJA117)
→    1    CT:     so you can't wake up your husband.
     2    C:      no:,
```

```
    (13)        "my husband fell over" (SJA101)
→    1    CT:     okay so you said⌈he fell over?⌉
     2    C:                      ⌊he fell over.⌋
     3    CT:     he fell over?
     4            and ⌈not ans ⌉wering.
     5    C:          ⌊yes.    ⌋
     6    CT:     okay,
```

So-prefaces can occur when a topic has been "delayed or temporarily derailed" (Bolden, 2008), and it can also signal "emergence from incipiency", i.e. indicating that the upcoming turn is not connected to immediately prior talk but emerges from earlier material (Bolden, 2009). In addition, "so" realises causal-type logical relations (i.e., reason, result and purpose), which has a direct link to the earlier reason-for-call stage, especially when the call-taker repeats the actual reason for the call. Therefore, when call-takers preface their repeat of the pre-emption with *so*, they can harness these three meanings simultaneously, as they orient to the fact that the reason-for-the-call sequence has already been opened by callers but had to be delayed until the address and telephone number were obtained.

The second format that call-takers can use is to design their turn as a "you-say-x question", a structure analysed in Danish talk-in-interaction (including emergency calls) by Steensig and Larsen (2008). This format can be combined with a *so*-preface, as in (13) shown above ("*okay so you said he fell over?*" l.1).

By contrast with the scripted prompt which is interpreted as a request for information, pre-emption repeat encourages callers to produce a confirmation (or disconfirmation). This is typically done over the course of one short turn containing a token of confirmation, as in (11) ("*yes love*" l.14) and (12) ("*no*" l.2). In our data, callers invariably treated pre-emption repeats as requests for confirmation, though they occasionally mentioned an additional symptom in the same turn, as in (14).

(14)   "heart attack" (SJA304)
```
→   1   CT:     it seems to you he's having a [heart attack.]
    2   C:      [yes and] he's not breathing.
    3   CT:     ↑right,
```

In response to the call-taker's request to provide an address, C had pre-empted a reason-for-the-call ("*yes my husband I think he's having a heart attack*"). When opening the reason-for-the-call sequence, the call-taker recycles C's pre-emption ("*it seems to you he's having a heart attack*" l.1). C's response contains a token of confirmation ("*yes*" l.2) as well as an additional concern ("*and he's not breathing*").

A parallel can be drawn with Heritage and Robinson's (2006) study on physicians' opening questions during primary care medical visits. The authors identified two main questions formats: general inquiries ("*What can I do for you today?*") and requests for confirmation ("*I understand you're having some sinus problems today?*"). Their results indicated a statistically significant association between the general inquiry format and longer problem presentations by patients. Heritage and Robinson (2006) argued that the request for confirmation format gives less opportunity for patients to "present their concerns in accordance with their own agendas" (Heritage & Robinson, 2006: 99). While in the context of a medical visit, it is important for patients to have sufficient conversational space to present their concerns, the issue is quite different in emergency calls. Dispatch protocols aim to rationalise the call-taking process by focusing on the essential information to be gathered and disregarding any other concerns – especially so in the context of a time-critical condition such as cardiac arrest. In this light, a question format which discourages callers from providing superfluous details is a

strategy worth investigating. By turning the reason-for-the-call sequence into a confirmation request, pre-emption repeat projects a confirmation by the caller. If the caller does so, the turn-taking system then immediately creates an opportunity for the call-taker to speak next – and thus to deliver the next scripted question (Figure 1). This strategy provides callers with an opportunity to disconfirm if they do not validate the call-taker's repeat, and they can also mention an additional concern in the same turn. However, it discourages them from launching into a multi-turn account containing irrelevant details – what Robinson and Heritage (2014) described as "expanded problem presentation".

Despite its interactional benefits, the strategy of pre-emption repeat was rarely (7 calls) used by call-takers in our data. This is arguably because it is not consistent with the dispatch protocol. Within the MPDS, call-takers are audited with respect to the performance standards defined by the International Academy of Emergency Medical Dispatch (2013). Failing to ask a scripted question, such as "*okay tell me exactly what happened*", is considered a "Moderate Deviation" (IAEMP, 2013: p27). Besides, designing a question as a request for confirmation (e.g. "so your husband collapsed?") could be considered a "leading question", which is prohibited at any point during the call (IAEMP, 2013: p.6).

Conclusion

Reason-for-the-call pre-emption is a common practice in emergency calls processed with a dispatch protocol in which the address and telephone number are the first two orders of business. This may be even more the case when callers are faced with a life-threatening emergency such as cardiac arrest. If we take the perspective of call-takers, we can see information volunteered out of turn as an attempt by callers to hijack the dispatch protocol. However, given that callers do not have access to the script, such disruptions cannot be entirely avoided. Managing caller pre-emption is an everyday challenge for call-takers. Yet, this practice remains understudied and dispatch protocols provide little advice to professional practitioners on how to deal with it. The aim of this study was to provide a first account of the potential repercussions that pre-emptions can have on the trajectory of calls, and thus, on ambulance dispatch delay.

We identified some of the characteristics of caller pre-emptions. They typically occur very early in the call, often as early as the caller's first turn. They most often receive minimum tokens of receipt by call-takers but are not explicitly attended to as they arise. The main challenge that pre-emptions pose for call-takers is when they open the "official" reason-for-the-call sequence later in the calls. If call-takers deliver the scripted turn "*okay tell me exactly what happened*" as usual, callers tend to treat it as a request for more information. They rarely repeat the reason-for-the-call they already pre-empted, and they can occasion delays by providing additional, superfluous information.

We believe that pre-emption repeat is an effective alternative strategy to integrate callers' pre-emptions. This strategy presents several sequential advantages: 1) it displays call-taker's understanding of the reason-for-the-call, 2) it provides an opportunity for callers to confirm/disconfirm this understanding, 3) it discourages expanded problem presentation,

and 4) it returns the floor to the call-taker who can move on to the next step in the dispatch protocol.

This study strengthens the evidence of the contribution that a conversational analysis (CA) of institutional talk can have on professional practices (Stokoe, 2014), and more specifically in medicine (Robinson and Heritage, 2014). However, few tokens of pre-empted repeat instead of the scripted turn "*okay tell me exactly what happened*" could be found, most probably because of call-takers' efforts to adhere strictly to the scripted protocol. Thus, we are not in a position to suggest a change in the dispatch protocol. However, it should be noted that an interactional analysis of 13 calls processed in Québec French with the MPDS has previously made such a recommendation (Laforest and Rioux-Turcotte 2016). When callers have declared that the patient is dead, Laforest and Rioux-Turcotte (2016) proposed that the prompt "*Dites-moi exactement ce qui s'est passé?*" ("tell me exactly what happened") could be rephrased as "*Qu'est-ce qui vous fait penser ça? Dites-moi exactement ce qui s'est passé?*" ("what makes you think that? Tell me exactly what happened"), in order to reassure the caller that they have been heard, and to minimise subsequent interactional misalignment. As Robinson and Heritage (2014) have argued, hypotheses generated by CA can be tested to determine whether a change in practice can have an effect on outcomes, as has been done before for emergency calls (Penn et al., 2016). Future research could investigate whether recycling the caller's pre-emption rather than delivering the scripted turn "*okay tell me exactly what happened*" translates into better time-management of calls.

Notes

[1] As stated by the Priority Dispatch Corp. on their website: "More than 56,000 certified emergency communications professionals use the Priority Dispatch System in more than 3,000 communication centers in 45 countries" (https://prioritydispatch.net/pds-system-solutions/, accessed 8 August 2017).

[2] This concerns OHCA cases of non-traumatic causes.

[3] The order in which questions are asked during call opening is different in the two main dispatch system used worldwide, the MPDS and CBD (Criteria-Based Dispatch, King County Emergency Medical Services Division, 2010). The MPDS asks first for the address and telephone number, and then for a reason-for-the-call. CBD asks first for a reason-for-the-call ("9-1-1, what are you reporting?"), and then for an address. To date, there is no strong evidence that the order of these questions impacts on dispatch accuracy. Hardeland et al. (2014) compared how two EMS, one using the MPDS (Richmond, USA), and one using CBD (Oslo), processed cardiac arrest calls. They found that recognition of cardiac arrest was not significantly different at the two sites.

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Funding and ethics declaration

Authors bionote

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Appendix. Transcription conventions

This paper follows the system devised by Jefferson (2004), using normalised orthography. The calls were discretely segmented in turn-constructional units (TCUs) following the guidelines presented in Selting (2000). Each numbered line in the transcripts corresponds to a TCU.

Symbol	Definition
CT:	speaker identification: call-taker
C:	speaker identification: caller
→	target line referred to in the text
(.)	micro pause
(..)	short/medium pause
(…)	longer pause
:	lengthening
=	latching
⌈ ⌉	overlap with following turn
⌊ ⌋	overlap with previous turn
↑	pitch upstep
< <l> >	low register level

< <h> >	high register level
< <f> >	fast temp
.	unit-final falling contour
?	unit-final rising contour
,	unit-final contour slightly rising or falling
-	unit-final level contour or mid-unit truncated contour
.h	in-breath
h	out-breath
?	glottal stop
WORD	louder volume, shouting
°word°	lower volume, whispered segment
%word%	creaky segment
((SNIFF))	non-linguistic sound or anonymised content
XXX	unintelligible segment