

# Mobile Phone Talk in Context

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**Abstract.** In light of recent attempts to design context-aware mobile phones, this paper contributes by providing findings from a study of mobile phone talk in context. We argue the benefits of investigating empirically the ways in which a place is interactionally constituted as appropriate, or not, for a mobile phone conversation. Based on a study of naturally occurring mobile phone talk, we show how people handle calls in potentially difficult situations. Availability is negotiated, and it is not always agreed on whether a situation is appropriate. These findings pose challenges to the design of context-aware telephony.

## 1 Introduction

Design providing remote awareness is a well-investigated issue in HCI (Human Computer Interaction) and CSCW (Computer Supported Cooperative Work), and has been studied empirically and evaluated over the years [13, 8, 5]. Recently, with the advent of mobile collaborative technologies, mobile awareness has become a topic of interest. There are a number of attempts to design context-aware applications, i.e. technology providing users with the possibility to see remote participants' location and activity, in order to determine whether or not to initiate communication [20, 25, 19]. However, it has been argued that many of these systems apply a simplified view of context [9]. Further, context-aware systems often derive from a strong technological focus, underbuilt by few, if any, empirical findings.

In this paper, we aim to contribute to the field of context-aware mobile telephony by adding empirical findings from actual use of this mobile collaborative technology. We explore how the participants themselves provide awareness and show availability, by investigating the talk over mobile phones. This is done by the detailed analysis of recordings of mobile phone conversations. Data has been collected by audio-recordings of the conversations, as well as video-recordings providing additional contextual information. A few excerpts are used in the paper to illustrate our findings on how the appropriateness of mobile phone conversations is established in respect to place and activity. We show how the appropriateness of having a conversation in the situation where the answerer or the caller is located, is negotiated and discussed in a more or less explicit fashion by the participants. It becomes clear that places and activities, which might seem inappropriate for conducting mobile phone conversations, are not always treated as such. Furthermore, the participants do not always agree on

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whether a place and an activity is appropriate or not, leading to negotiations. We discuss what these findings might imply for design of context-aware mobile telephony.

## 2 Related Work

This work originates in two fields; that of context-aware applications, particularly mobile phones, and that of studies of mobile phone use. These two fields are outlined, below, along with a brief introduction to Conversation Analysis (CA), to ground the empirical approach used to understand mobile phone talk in context.

### 2.1 Context-Aware Mobile Phones

As a crucial aspect in cooperative work, awareness has been much investigated in CSCW and HCI, as part of co-located work [8, 1, 12] as well as remote and mobile collaborative work [3, 18]. There have been attempts to design applications that provide awareness to mobile users. In this paper we focus on attempts to design mobile phones which to some extent provide users with information about context, and in specific, systems which aim at settling the appropriateness for conducting calls.

Several attempts to design context-aware mobile phones rely on the use of calendars. Milewski and Smith [20] present an application, the live address book, which aims at helping people make more informed telephone calls. The users are supposed to set availability status, refer to which telephone number on which she can be reached, and there is also room for a personal message. All this information has to be kept updated by the user. From the technical trial Milewski and Smith learnt about the effort in updating, the reliability of the information provided, ways of negotiating availability, etc.

Another example is Comcenter, [4], a system which shows awareness information about the recipient before starting a communication act. For instance, if an organization uses open calendars, the current calendar entry can be shown or a user specified message could be displayed, which enable some sort of rudimentary one-way “negotiation” before communication is initiated.

There are also attempts to combine calendar data with automatically retrieved contextual information. One example of this is SenSay, a context-aware mobile phone [25]. With a starting point in the ‘troublesome’ activity to keep the phone in its correct state, i.e. the ringer on or off, determining call priority, etc., a mobile phone is introduced which modifies its behavior based on its user’s state and surroundings. SenSay uses data from a number of sources, including appointments scheduled in a calendar, if the user is in a conversation or speaking aloud, if physical activity is high, and level of ambient noise, to determine whether the user is “uninterruptible”. SenSay provides the remote callers with the ability to communicate the urgency of their calls, makes call suggestions to users when they are idle, and provides the caller with feedback on the current status of the SenSay user.

The problem with many of these systems is that they rely on the idea that it is possible to build into the design an understanding of what is ‘an uninterruptible activity’.

Context is seen as a more or less stable entity. This approach has been criticized because it is based on a view of context as a representational problem [9]. Dourish introduces an interactional model of context, where he argues that context is an *occasional* property, relevant to particular settings, particular instances of action, and particular parties to that action. Further, rather than taking context and content to be two separable entities, he instead argues that context arises from the activity. Drawing upon CA and ethnomethodological work, Dourish argues that context is not just there; rather it is actively produced, maintained and enacted in the course of activity at hand.

Based on Dourish's critique, along with the observation that there is a lack of studies based on empirical findings, we believe that it is necessary to examine today's actual use of the mobile phone, in order to design supportive tools.

## 2.2 Studies of Mobile Phone Use in Context

The mobile phone is increasingly receiving attention as a collaborative technology. There is work on the adoption of mobile phones [21], text messaging among teenagers [11] and mobile phone use among young people in general [26]. However, there is still a lack of studies using naturalistic data to understand the actual interaction with technology, as is common in CSCW studies with a stronger ethnographic focus. Most studies rely on accounts of use [e.g. 22, 17], rather than on analysis of the actual interaction. Although a useful method for some inquiries, we want to stress the benefit of understanding mobile phone use in context.

One example of relevance for the issues dealt with in this paper shows the sort of arguments that can be made using accounts or other forms of data. Many authors claim that the mobile phone privatizes public space, as it enables people to have private conversations in public places. For instance, in discussing mobile phone culture in Finland, Puro maintains that: "as someone talks on the phone, one is in her or his own private space. Talking on the mobile phone in the presence of others lends itself to a certain social absence where there is little room for other social contacts. The speaker may be physically present, but his or her mental orientation is towards someone who is unseen" [23, p. 23].

However, previous ethnographic field studies of mobile phone use in natural settings, display how in some situations, conversationalists include co-located others in the mobile phone communication, rather than withdrawing to have private conversations. One example of this is related in Weilenmann and Larsson's [28] fieldwork on public mobile phone use among teenagers in Sweden. In one illustrating excerpt from the field study, four girls all take part of a mobile phone call received by one of them, and they relate to the caller what is going on in the group at their end. From this field study it seems clear that the young people studied do not exclude their co-present friends when talking on the mobile phone, they remain attentive to the ongoing event as well as that on the phone. Studying mobile phones in context revealed that their usage can be a shared collaborative activity.

A similar lack of focus on naturally occurring interaction is present in most existing studies on mobile phone use in traffic (e.g. [19, 27]). Most of these studies take the starting point in experimental or laboratory settings to be able to "control" the

variables, in order to investigate how the use of mobile phones influences driving, a highly complex activity per se. The methodological benefits of focusing on mobile phone use as part of natural traffic situations are discussed in [10].

### 2.3 Conversation Analysis

From the very beginning, CA has been closely linked to the analysis of phone conversations. One practical reason was that telephone calls were particularly suitable for CA methods. By making audio recordings of both ends of phone conversations the researcher would get access to much of the same interactional resources as the participants, since they also are only connected through audio. Most important to this is that, on the phone, participants have no visual access to each other.

For the purpose of this paper, it can be valuable to point out a few CA findings relating to the participants' availability for having a conversation, and show how CA can be useful when understanding the situated nature of mobile phone talk.

Schegloff [24] identifies a number of ways in which the second turns in the phone call (the caller's first turn) are constructed. Of specific relevance for the present study is the case where the second turn formulated as a "question or noticing concerning answerer's state". For instance, this can look like the following [24]:

A:	Hello
C:	Hi can you talk

Or

A:	Hello
C:	Hello. You're home

This deals with issues of availability for having a conversation, as well as recognizing where the answerer is located. Of course, in the second case, the fact that the caller knows that he is calling to a residence home, a landline phone, is obvious. If someone answers this call, the caller can be certain that the called is home where the phone is located. This is obviously different in the case with mobile phone calls.

Button and Casey [7] report on a phenomenon relevant when considering how availability is established in phone conversations. They show how questions about what the co-participants are doing, thus an "inquiry into immediately current events", what they call topic initial elicitors, occur after the identification and recognition section. They argue that these topic initial elicitors "make a display of availability for further talk but without, themselves, introducing topic material provides the opportunity for, as a preferred next activity, a newsworthy event reported in a next turn" [7, p. 172].

Taking a yet larger perspective on the telephone conversation, another study by Button deals with how a conversation is organized as part of a series of conversations. He found that arrangements may be oriented to as a "special status topic", which is specifically used to place the conversation on a closing track" [6, p. 251]). One way of doing this is through "projecting future activities", for instance, talking about whom should call a third person and make arrangements, etc.

### 2.3.1 Conversation Analytic Work on Mobile Phone Talk

There are so far few CA or CA inspired approaches to mobile phone conversations. Apart from the newness of mobile phone technology, one of the reasons is likely to be because it is relatively difficult to get recordings of mobile phone conversations.

In one of the first available studies of mobile phone use based on recordings, Laurier [15] investigates the ways in which mobile office workers talk about location when traveling by car. He seeks to explore “why people say where they are during mobile phone calls”. Laurier’s argument is that this is a question of location used to establish a mutual context in communication, between participants who are dislocated. The formulation of location in mobile phone conversation is tied to the business that needs to be done between the two people, and the place descriptions are thus doing a lot more than just formulating place. Laurier’s study is ethnographic and uses video to capture the interaction in the car, where the researcher is present. This means that a rich description can be provided of the setting in which the driver/mobile phone user is located. Having this data becomes even more useful in another of Laurier’s papers, where he expands upon the issue of how mobile workers handle their daily work and talk alongside the task of driving and maneuvering the car [16]. Other studies of mobile phone talk are more focused on the particulars of the conversations [2, 14].

Methodologically, it is noteworthy that Arminen [2] points out that ethnographic data of the local circumstances and constraints of the answerer could sometimes be used to shed light on what is happening in the opening of the conversations. In some situations it is difficult to answer the phone, but for some reasons it is done anyway. For instance, Arminen shows an example where a caller answers while being in the toilet of a train, and what interactional difficulties this entails in the conversation.

## 3 Data Collection

The empirical data presented in this paper derive from two separate projects. They both rely on recordings of naturally occurring conversations, but they are different in a number of ways.

The first piece of data was originally collected for a study looking at the impact of mobile phone talk on driving [10]. In order to understand how drivers combine mobile phone conversations and driving, seven drivers were studied. The person we follow here is called Eric. He is a salesman who travels over a vast geographical area. Each year he drives roughly 100.000 kilometers, to visit customers on a regular basis. He uses his car both as a means of transportation, and as a mobile office where he conducts paper work and mobile phone calls.

The analysis required the conversations, a comprehensive view of the traffic-situation, as well as a view of how the driver handled the vehicle. Accordingly the researcher sitting in the passenger seat collected the data by video recording the activities taking place in the car. By using a single video camera we were able to alter the perspective between activities in the car, and the traffic-situation. The video recordings show only some of the visual details that occupy the drivers’ attention. Thus, the video camera is not a way of collecting complete observable data. It is rather a

tool for the researcher that provides contextual data from one side of the conversation.

The data presented in Excerpt 1 comes from a driver who used a car-mounted phone; i.e. the mobile phone was put in a holder on the dashboard, connected to a speaker and a microphone. The participants in the study agreed on being recorded, and are presented in a way that protects their identity. They were also requested to inform us if any conversations were not appropriate to record, and should be deleted.

In the second study [29], the conversations of a teenage girl were recorded using a special recording device, which was built in order to collect mobile phone talk data. One person was recruited to have her calls recorded, an 18-year-old girl here called Nicky, living in a small suburb to Göteborg, Sweden's second city.

Also for this study it was made sure that the informant would feel that she was in control over what was recorded. The informant had the possibility of deciding which phone conversations to give to the researcher. After having recorded a conversation, she herself could delete it if she did not feel she wanted it to be used for the study. She was told to let her friends know that she would be part of this study, so that those who did not want to be recorded could say so. A few of her friends then chose not to be recorded. All names of persons appearing in the conversations have been changed.

For the latter study, we did not gather any ethnographic data. As discussed previously, leisure activities can be more difficult to get access to. This clearly led to some lack of insight into the context of the calls. On the other hand, the calls presented here, took place in situations which it is doubtful if any ethnographer with a video camera would have been given access to.

## **4 Mobile Phone Talk in Context**

In the following we illustrate the various ways in which a place is interactionally constituted as appropriate for having a mobile phone conversation.

### **4.1 The Car as an Appropriate Place to Talk**

The participants in the study on the impact of mobile phone talk on driving [10], noticeably favored a car in motion for phone conversations. They adapted their activities to make calls when driving, e.g. initiating conversations immediately after entering the car, and terminating conversations when reaching their destinations.

In the following example the explicit choice of the driving situation, consequently the car, as a suitable place for conversation is evident. This is observable in how they express themselves in the conversation, and in how Eric uses his phone.

Having had lunch at a hotel in the outskirts of Smalltown, Eric switches his hand-held on and puts it back in the holder on the dashboard, immediately after entering the car. He receives a text message telling him that there are four messages in his voice-mail. The amount of messages is caused by the fact that he turned off his phone during a lunch break, and during a recent visit at a customer's site. As he exits the parking lot, Eric returns the call from Fredrik:

## Mobile Phone Talk in Context

	Conversation	Inside the car
Fredrik:	The Sport Shop, Sandstad, Fredrik	
Eric:	Hi Fredrik! Eric Sport Products	Eric keeps one hand on the steering wheel. Looks straight out on the road.
Fredrik:	Hi:::	
Eric:	Ho:w are you	Eric looks down from the road, probably adjusts the heating with his right hand.
Fredrik:	I'm fine:	
Eric:	Sounds good:	Lowes his right hand. Only one hand on the steering wheel.
Fredrik:	Will you be in the car for a while?	
Eric:	if I will be in the car for a while? >yes< you can give me a call	
Fredrik:	>Yes<	
Eric:	Yes	
Fredrik:	I'll call you	Eric looks at the phone.
Eric:	Sounds great	Eric looks out on the left.
Fredrik:	>Bye<	
Eric:	Bye:	Eric looks down on the phone, and uses his right hand to end the call.

**Excerpt 1.** During this short conversation, Eric and Fredrik mutually agree on the car as an appropriate place for mobile phone conversations.

The answerer gets out of the conversation before a topic is initiated. The way of doing this is to make arrangements for calling back later. Fredrik asks whether Eric will be in the car for a while. This might seem like an odd question, why would he want to know that? However, Eric does not take the question to be odd, rather he takes it as a question of whether he will be available for conversation a while later. He displays his understanding by saying “Yes you can give me a call”.

Thus, their conversation clearly shows how they consider the time spent in the car as time available for incoming as well as outgoing calls, i.e. telephone hours. The excerpt nicely shows how both the driver, and the non-present conversationalist, orients themselves to the car as an appropriate place to talk. The time for transportation is time ‘forced’ to be spent in the car. Consequently, the time can be used for conversational work. Additionally, the ethnographic study revealed that Eric switches off the mobile phone during lunch breaks and visits at customer sites, and immediately switches it back on when entering the car. This behavior reinforces the view of the car as an appropriate place to talk.

The transcript displays how the place and the activities, e.g. the contextual factors, are non-static. Despite the fact that the environment within the car is a fairly stationary setting, several simultaneous activities take place both within and outside the car, e.g. changing gears, adjusting the heat, doing maneuvers, adjusting the speed to other cars. The traffic situation is dynamic, and the driver has to adapt to these contingencies. Even if he focuses on several simultaneous tasks, the driving situation is appropriate for him to conduct other activities, in this case a mobile phone conversation.

Second, the transcript illustrates the difficulties in deciding, and defining in advance, the appropriateness of a call. The complexity in setting the appropriateness in

time and space for a conversation, due to contextual factors, is visible in how they postpone the conversation to a later occasion.

Third, and this is important when considering design of context-aware applications, despite the inappropriateness in having a conversation, Fredrik answers the phone. For some reason he cannot talk at the moment but still takes the call, thus being able to reach an agreement on when to call back. This can also be a way to check whether the call is very urgent and should take precedence for the current activity. In any case, the conversation is held in a situation which might have been considered as “uninterruptible” by a system, and the fact that the conversation can take place despite this, allows the participants to reach an agreement on when to continue talking.

#### 4.2 Making Place for Mobile Phone Talk in an Inappropriate Place

Moving on to a setting different from the car, we will consider an example where a call is received, and answered, in a classroom.

Nicky:	Hi! <sup>1</sup>
Oscar:	Hi::
	(.)
Nicky:	What are you doing
Oscar:	I'm having a class: but it's no problem hhh
Nicky:	Okay h:
	(.)
Oscar:	Well::
Nicky:	You
Oscar:	Yes:
Nicky:	Tonight
Oscar:	Yes:
Nicky:	Whe:::n eh:: blublub do we get anything to eat?
Oscar:	No
Nicky:	We don't?
Oscar:	No
Nicky:	Okay then (.) then I'll have to eat now then

**Excerpt 2.** In this conversation, the answerer and caller adjust to the fact that the answerer is located in a classroom during class.

Here we can see how the caller is informed that she has called someone who is in class at the moment. However, the answerer claims that his being in class is not a problem, thus displaying availability. He does this in one turn “I’m in class but it’s no problem”. It is interesting that on the question “what are you doing?” he does not just answer that he is in class; he also says that it is not a problem. Probably this is because many of us would actually see this as an activity where one is (or should be) unavailable for talking on the phone, and he therefore needs to state that he is not one of these people. Presumably, it could be a problem for other people in his immediate surroundings, e.g. the teacher. Perhaps this is also a way then to “be cool”, to show that he can do as he pleases.

<sup>1</sup> It is unclear here why the caller utters the first turn, the initial “hi”. We are not sure whether there had been some interaction prior to this; this is all that is available on the recording.

## Mobile Phone Talk in Context

So, in the next lines we can see how the caller and the answerer together are making place for mobile phone conversations to continue in this setting. The way that the conversation unrolls after he has said where he is, is peculiar. There is a long sequence with one word turns before she initiates the topic. This can be because she does not really have a topic, and comes up with one as the call develops. It could also be because she is orienting to him being in class, she might find this more problematic that he pretends to do. Therefore in initiating the topic step by step in short turns, she gives him the possibility of saying that he cannot talk. This argument is supported by the fact that she is hesitating and rephrasing her question about whether they will get anything to eat. She is perhaps searching for a way to formulate herself so that he does not have to give a lengthy answer, given the presumed inappropriateness of having a mobile phone conversation in class.

In this conversation, Nicky and the person in the classroom struggle with what it means to be in a classroom, and what sort of activities are appropriate in such a place. On the one hand, the answerer says that it is not problem for him to have a conversation during class, on the other hand, the conversation proceeds in a way that seems sensitive to place and situation.

### 4.3 An Inappropriate Place to Talk

In the previous excerpt, we saw how a mobile phone conversation was conducted in a potentially inappropriate place, and how the participants cooperated to make place for the conversation in this setting, using a set of conversational strategies. In the next excerpt, the answerer is in a place that also may seem inappropriate, namely a fitting room. It shows how the caller and answerer negotiate about the appropriateness of a place in terms of conducting a mobile phone conversation.

Nicky:	I think that was nice yeah hi
	((sound of door closing))
Richard:	What?
Nicky:	Hi
Richard:	Hi hi
Nicky:	But I can't talk now (.) cause
	[I'm:: in a fitting+
Richard:	[oh yeah what should I do about that then
Nicky:	E:hehehe:
Richard:	What are you doing then?
	(0.3)
Nicky:	I'm si+ I'm standing in a fitting room and trying on clothes
Richard:	Oh yeah:::
Nicky:	M
Richard:	Oh yeah:::
Nicky:	Yes!
Richard:	Yes (.) AND?
Nicky:	Heh I'm calling you later
Richard:	No you don't at all I'm not home h
Nicky:	Oh yeah oh well I'm
	[calling you tomorrow then
Richard:	[you'll have to call the mobile then
Nicky:	Yes
Richard:	Yes
Nicky:	Yes

Richard:	Hi
Nicky:	Hi

**Excerpt 3.** The caller and answerer negotiate the appropriateness of a fitting room as a place for conducting a mobile phone conversation.

The answerer, Nicky, is in a fitting room talking to someone co-present, when she receives and answers the call. The answerer's first turn seems to have multiple recipients; she seems to orient herself to more than one listener. The utterance "I think that was nice yeah hi", has two parts. The first ("I think that was nice") presumably is meant for the other(s) present with her in the fitting room or in the shop. The second part ("yeah hi") is presumably meant for the caller. However, it might be more complex than this. The fact that the caller has access to the entire first turn makes it possible for the caller to use this as a resource. In hearing "I think that was nice", the caller can draw some conclusions about the location and activity in which the called is engaged. It might also be that the utterance is designed to give the caller this background information. This could then be a way of showing that she is already engaged in a conversation with someone co-present, meaning that she is busy. Also, if she wants to get the conversation on a closing track from the beginning, letting the caller hear this piece of talk could be a strategy of displaying her unavailability. So, the access to background noise might play an important role in settling the suitability to continue a phone call. In this conversation, the caller could immediately in the opening of the conversation, potentially get some clues that the caller was busy, which he then, in a fashion that increasingly annoyed the answerer, chose to ignore.

After the greeting sequence, the answerer's first thing to say is that she "can't talk now". She thus tries to initiate a closing of the conversation in the beginning of the conversation. In line with the argument in Button, she is trying to place the conversation on a closing track [6] by saying that she will call him later, thus making arrangements for the future. Button identified this specific topic as being one used to begin the closing of a conversation. However, the caller is not cooperative in this matter. It takes Nicky quite a few turns after having initiated the closing, before she can actually get out of the conversation, and end the call. She says explicitly that she is unavailable for having a conversation - "I can't talk now" and begins her explanation to why she cannot do this "I'm in a fitting room". The caller does not seem to hear her explanation; just that she cannot talk right now. The question "what are you doing then?" seems to imply that he wants a good explanation for why she cannot talk to him right then. The second time she explains why she cannot talk; she does this by giving both location ("I'm standing in a fitting room"), and activity ("and trying on clothes").

In the beginning of the phone call, Nicky seems amused by the fact that she is answering while being in a fitting room, but as the conversation develops and she has difficulties ending the conversation, she seems more and more annoyed. Although this caller might have been unusually unwilling to cooperate, it is interesting to see how the called tries to get out of the conversation by saying what she is doing, and how this is treated by the caller.

The main point with this excerpt in relation to the topic of the paper, is that it shows how the caller and answerer negotiate the appropriateness of a place in terms of conducting a mobile phone conversation. In line with the argument of the case of

the conversation in the classroom, this excerpt gives insights into the notion of what type of activities belongs in a certain place. Nicky shows quite vividly that she does not consider a fitting room an appropriate place to talk. However, it is clear that the caller does not agree, by his reaction when she says where she is. The conclusion that they do not agree on whether this situation is appropriate or not for having a conversation, clearly adds to the complexity of designing technology which provides the caller with contextual information about the called party.

## **5 Discussion**

The excerpts from naturally occurring mobile phone conversations illustrate how the conversations have been dealt with, despite the difficulties and constraints set by the places and ongoing activities. The conversations have taken place in: a car, a classroom, and a fitting room, all places where it is clear that other activities than talking on the mobile phone are normally going on.

### **5.1 Mobile Phone Talk in Context**

The possible variation in places and activities attached to mobile phone use, contribute to the complexity of understanding mobile phone talk. Place and activity are important for understanding the appropriateness to conduct mobile phone conversations.

We have shown how the car is treated as an appropriate place for having a mobile phone conversation. There can be several reasons why this is so. First, the car is a place where talk can be carried out without interruption. The car in this sense is a private, secluded area. On the other hand, the car moves within a public domain, the road area, and the driver can be held accountable for actions within this place. The conversations however, are private within the car.

As a contrast to the car-example, this excerpt also shows us that a restricted secluded area is not necessarily always suitable for a conversation. The fitting room was not taken as appropriate for having a conversation by the answerer. This can be because of the activity taking place in here is private (changing clothes, grooming) as opposed to the more public activity of driving a car. Further, another explanation is that trying on clothes is difficult to do while talking on the mobile phone, simply because there is a need for holding the phone or keeping the headset adjusted, whereas it has been shown how drivers can handle the car while talking on the phone with ease. Also, fitting rooms ordinarily do not provide people with soundproof walls, so that the conversation taking place there is not necessarily private; other people can listen in. On the other hand, many people have conversations in public.

The study has provided us with insights on how to reach a mutual agreement on the appropriateness to continue the conversation over the mobile phone, despite the situation at hand. In the example from the study on the salesman in the car, we see how the remote part clearly understands that Eric is sitting in his car, probably driving, and how they despite or maybe even because of this, agree on the car as appropriate for talking. However, in the example of the call to the person in the classroom,

the answerer states that he is in the classroom, but this is not a problem. Nevertheless, the caller clearly hesitates after hearing this, and the conversation continues a bit stumbling. The situation is a bit different in the fitting-room example. The answerer tries to end the conversation, without immediate success. The remote caller continues to talk, and seems to think it is okay to keep the conversation going. The lesson is that it is not always the case that people reach an immediate understanding on the appropriateness of conducting a mobile phone conversation, and people can have different opinions.

## 5.2 Challenges for the Design of Context-Aware Mobile Phones

The context-aware systems we focus on in this paper attempt to provide remote users with contextual information. In specific, these systems aim at settling the appropriateness for conducting the calls. Our findings can be used to pose some further challenges for the design of context-aware mobile phones.

First, it becomes clear that places and activities, which might seem inappropriate for conducting mobile phone conversations, are not always treated as such. Excerpt 1 and 3 illustrate how one party of the conversation cannot talk at the moment but still takes the call, thus being able to reach an agreement on when to return the call. This can also be a way to check the urgency of the call, and whether it should take precedence for the current activity. In any case, the calls are answered in situations that might have been considered as “uninterruptible” by a system, and the fact that the conversations can take place despite this, allows the participants to reach an agreement on when to continue talking.

Second, as we have seen, it is not only up to one single participant to decide upon the appropriateness for a conversation. The conversationalists do not always come to joint agreement on whether a place and activity is appropriate or not. Rather, it is an ongoing negotiation-work between the conversationalists. The data illustrate the difficulties in deciding, and defining in advance, the factors that influence the appropriateness of a call.

In general we believe that the design of context-aware mobile phones would gain from studies on everyday mobile phone use. The main problem with systems providing remote awareness is how they rely on the idea that it is possible to build into the design an understanding of what is an ‘uninterruptible activity’. Our study illustrates how the participants reach a mutual understanding of a situation as appropriate for having a mobile phone conversation. This is not something which easily can be set in advance. The empirical data reinforces Dourish [9] arguments on context as not just being there; rather it is actively produced, maintained and enacted in the course of the activity at hand.

## 6 Conclusion

In this study, we have taken a closer look on the ways in which a place is interactionally constituted as appropriate for having a mobile phone conversation. The empirical

data illustrate a number of instances on how mobile phone conversations are treated as part of the activities in which the answerer, or caller, is involved.

First, we have shown examples of how the appropriateness of having a conversation in the place where the answerer or caller is, is negotiated and discussed, in more or less explicit fashion, by the participants. Places and situations that might seem inappropriate for conducting mobile phone conversations are not always treated as such. Furthermore, the participants do not always agree on whether a place is appropriate or not, leading to difficulties.

Second, we have demonstrated how a mobile worker uses the car as his main place for taking and making mobile phone calls, and how his contacts orient to the car as a place for calling this particular person. The conventional view is that the car is not an accepted place for mobile phone use, seeing that it is banned in several countries (however not in Sweden). Our findings support previous studies [10, 16] in showing that drivers adjust the mobile phone conversations to the traffic situation.

Third, we have presented a discussion on the challenges involved when studying mobile phone use as part of mobile activities. We have argued the benefit of combining audio-recordings with video-recordings and ethnographic observations, thus making it possible to study how the called party treats the incoming call and deals with the local constraints of the setting. The additional contextual data provided using these methods contribute to the understanding of the conversations.

Fourth, in relation to the design of context-aware mobile phones, the empirical data point to the challenges in deciding and defining in advance the factors that influence the appropriateness of a call. Calls are answered in situations which might have been considered as “uninterruptible” by a context-aware mobile phone, and conversations take place despite this. The challenge therefore, becomes to design systems which allow for negotiations, and support the context work taking place in mobile phone talk.

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