"Are You Watching This Film or What?" Interruption and the Juggling of Cohorts

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ABSTRACT

A proliferation of mobile devices in everyday life has increased the likelihood of technologically mediated interruptions. We examine ethnographic data from an SMS-based pervasive game in order to explicate the situated character of interruption. Ethnomethodological analysis of gameplay in the context of participants' everyday lives shows that interruption handling is shaped by its accountability to the various people or 'cohorts' whose concerns participants need to juggle simultaneously. Findings inform existing approaches to design where certain presuppositions regarding the nature of interruption prevail. Accordingly, we propose an approach to interruption handling that respects the ways in which people orient to and reason about interruptions locally in the conduct of situated action.

Author Keywords
Ethnomethodology, interruption, disruption, accountability.

ACM Classification Keywords
H.5.3 Group and Organization Interfaces: *Computer-supported cooperative work*

INTRODUCTION
In this paper we explore the familiar CSCW topic of interruption in a different way. We do this by examining a study of a mobile text-message game that demands player engagement across a range of different settings. We explore the impact of gameplay, and the inevitable disturbances that result from it, on how people make their actions accountable to the various cohorts they are involved with. This leads to a consideration of whether we might move beyond existing design agendas in relation to interruptions, which tend to concentrate on either mitigation of negative effects or augmentation of positive ones.

Mobile Technology and the Juggling of Cohorts
Everyday life is now populated by multiple devices, a number of which may be on our person or within easy reach

at any moment in time. Mobile phones, portable media players, PDAs and Blackberries, even laptops, may spend much of the day in our pockets or by our sides. The presence of such technologies has undoubtedly had a significant impact on our lives, so much so that the structure of everyday life is demonstrably changing. Work and leisure have become much more deeply intertwined [2]. They have also become mobilized. Now we can work and play both on the move and in settings that were once the preserve of more specifically defined courses of action. Consequently, the ways in which we account for our actions have grown to encompass new technologies and the effects they have on our interactions with both the other members of the settings we inhabit and with people in other settings too; our *cohorts* in other words.

We do not use mobile technologies in isolation from everyone else around us and the expectations *they* have regarding how *we* should proceed. When technology brings work into the home, for example, the chances are we will be engaged in 'at home' activities and be in the company of people who expect us to be 'at home'. The converse holds for when we are 'at work'. Mobile technologies obviously blur these boundaries. Less obviously, they oblige us to make ourselves accountable to those we contact or who are contacting us *and* to those around us. The two orders of account are not the same, as the practical concerns of those we are physically located with and those we are digitally connected to often diverge. We may regularly interact with a large number of different cohorts, some who may only ever be encountered online. For each cohort different expectations and accountabilities may hold. At the same time each cohort may generate disturbance in our actions, interrupt our interactions with other cohorts, and oblige us to 'juggle' between them. The purpose of this paper is to understand something of how the juggling is done through the accountable management of interruptions.

When we talk about the accountable management of interruptions we refer to the ways in which cohorts make their actions intelligible to others. This is an ordinary understanding of accountability. Our interest in accountability is also disciplinary and rooted in ethnomethodology [15], where the ordinary accountability of action is of fundamental concern. Ethnomethodology takes it that we *make* our own and others actions accountable all of the time; that the making is done in *methodical ways*; and that those methods are synonymous with the

social organization of particular phenomena: interruption handling in this case. As Suchman [40] reminds us, social organization is also synonymous with cooperative work. What our investigation of the accountable management of interruption handling offers, then, is an understanding of the real world, real time ways in which technologically mediated interruptions are cooperatively organized.

VIEWS UPON INTERRUPTION

A growing body of research investigates the ways in which new technologies interrupt everyday life and make users accountable in a variety of different ways. Aoki and Woodruff [2], for instance, have noted that an "increasing range of wireless personal communication systems" give rise to the need for users to manage "increasingly spontaneous" interactions across settings that they once sought to keep apart. In a study of Blackberries, Mazmanian et al. make a number of observations regarding the moral ordering of corporate technology in the home, revealing that users have to manage a "compulsion to check" and are often "unable to disengage" while being at home and, consequently, that "work-time" and "home-time" is increasingly subject to renegotiation [27]. Grinter et al. [19], in a discussion of how teenagers handle text messaging, find a range of well-honed strategies for managing accountability. One such strategy is literally avoiding the need to account for use by rendering the use invisible to those around you. This covers a range of things such as becoming adept at keying silently, keying surreptitiously, sending texts from private places such as bedrooms, covering use through the presence of other more visible technology, and so on.

Recognition of this growing potential for disruption posed by new kinds of technology is acknowledged by researchers across the interruption literature.[1] The literature in CSCW and HCI concerning interruptions and interruption handling is both large and heterogeneous. While there are many reports that we would acknowledge had we more space, the best that can be done within the confines of a short research paper is highlight the *prevalent* assumptions, interests and concerns written into the literature and recognize that nearly all of the research in this area has focused exclusively upon interruptions in the workplace. Several researchers have treated the issue in a more agnostic fashion, focusing on socially motivated interruption [10], and there have been a few studies of interruptions in mobile [38] and home settings [30], but the bulk of the literature remains focused on work-related interruptions.

There is something of a tradition in the literature of looking at the rate of interruption in knowledge or information work [17] and this has recently begun to be set against some larger theoretical interests in what has been called the 'attention economy' and the problem of 'information overload', with time and attention being treated as important and limited resources or commodities [22]. Some commentators have noted a strong tendency in the literature to focus upon the people being interrupted rather than those doing the interrupting [e.g., 18]. As is pointed out by [20] there has also been a primary focus upon interruption in relation to individuals rather than larger communities, though this too has begun to change [25].

The overwhelming majority of research relating to work-based interruptions is premised upon the view that interruption is inherently harmful to task performance [16] and that its cost must be weighed in relation to the benefits that might accrue to it [3, 29]. In the context of information work and management the kinds of negative impacts that are seen to accrue to interruption are seen to be related to an ongoing pressure towards frequent switching between tasks [13] with interruptions leading, in the words of Mark et al. [25] to "fragmented working spheres". These kinds of accounts speak of the problems of maintaining attention in relation to various ongoing activities and the detrimental effects of a high cognitive or mental load [35]. Negative outcomes of interruptions are seen to cluster around the rate and quantity of errors, difficulty in recalling or resuming prior tasks [10], poor decision-making [39], reduced time performance [35], stress and more negative emotional consequences [1, 28], and frayed social relations [23].

As a result of adopting this perspective towards interruption there are two key approaches towards developing technical solutions. One of these is to try and prevent interruptions from happening through strategies such as postponement [35], management of what is allowed through [18], pre-notification [3], and so on. The other, more tailored strategy towards developing solutions is to tackle not the interruption itself but rather the amelioration of its worst effects [6]. Here the literature is quite extensive but, once again, falls largely into two basic concerns: 1) tackling the character of notification [21]; and 2) facilitating the resumption of what has been interrupted [35]. Notification management covers an array of interests including when best to interrupt [4], the actual character of notifiers [8] and associated interruption modalities [39], ambient and peripheral awareness mechanisms [14], the design of non-disruptive UIs [35], desktop agents [26], and so on.

Appreciating that interruption is often initiated by people who are located at some distance from those who they are interrupting, and that a part of the problem may reside in the fact that those people do not really know the current context of those whom they are contacting [34], another body of literature devotes itself to understanding how to let potential interrupters know the status of the people they are contacting [10, 38]. Once again a range of topics are explored here including the mediation of remote access [32], the building of systems that can detect certain facets of people's local context [6, 18], the detection of peoples' attentional states and availability for contact [20, 30], and the wider assessment of who else might be disturbed by

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[1] See http://interruptions.net/literature.htm

making contact with an individual [26]. Whilst research in this area often looks to support a completely different set of people (i.e. contact initiators), it still implicitly buys into the notion of interruption being essentially negative in its consequences. It is hardly surprising in that case that there are certain aspects of the literature that seek to emphasize the more positive consequences of interruption. Here the interest is in how interruptions might serve to support interdependencies between people when engaged in cooperative work [16, 25], not to mention the acquisition of potentially important and constructive information.

We treat the matter of whether interruption has a positive or negative impact with methodological indifference [24]. We take interruption and the disruption of action to be an inevitable fact of life, borne of a multitude of contingencies [e.g., 25, 36]. This being the case, we are concerned with how disruptions often require people to simultaneously manage interaction between different cohorts, and the distinct forms of account this entails. This interest in the *situated management* of interruption is not in itself new. Others have also sought to investigate interruption management strategies [e.g., 10, 33], and how people practically deal with interruptions in a variety of ways, from 'holding-off' behaviours [12] to actual avoidance of interruption through the placement of objects, doors, and physical relocation [7]. However, once again the core concern in many of these cases is with how to use an understanding of these phenomena in order to mitigate the impacts of interruption upon task performance [10].

Nearly all of the studies we have cited acknowledge implicitly or explicitly that there are a huge number of different concerns that people may orient to in the management of an interruption [18, 20]. However, what few studies seem to do is to tackle the issue through a detailed exploration of how interruption handling is accountably managed and organized or ordered, including morally ordered, by cohorts. Addressing the issue in this way opens up the opportunity for solutions that are grounded in the real world, real time social organization of interruption handling. Specifically, it grounds design in the methodical ways that people handle interruptions in the company of their cohorts.

GAME PLAY AS A PERSPICUOUS SETTING
We illuminate the real world, real time character of interruption handling in everyday life by reflecting on ethnographic data detailing how members of the public went about playing a 24-day pervasive game largely via SMS text messaging on their mobile phones. The game was jointly developed by the performing arts group Blast Theory, and the Mixed Reality Laboratory at the University of Nottingham. We are not the first to use games as a 'perspicuous setting' – i.e, a setting that may shed light on the socially organized character of situated action. Several researchers before us have sought to consider how the playing of games is accounted for by players in the course

of interaction [31], or how people change their patterns of everyday life to incorporate games [e.g., 5], or how games may be used to develop experimental understandings of interruption handling [13]. However, we continue a tradition of studying gameplay 'in the wild' [11] to uncover, in this case, how interruptions are managed in the context of the *other* ongoing affairs and situations that comprise participants everyday lives. In other words, by studying the real world, real time character of gameplay in the wild and with respect to its relationship to the other events participants' days are made up of, we seek to uncover *how* the game is made answerable or accountable to their quotidian concerns and to use this understanding to inform broader debates on interruption handling.

Day Of The Figurines is multiplayer board game that is played using text messaging on mobile phones. The game follows 24 hours in the life of a small virtual town. At a live venue the players encounter a board representing the game and choose a small plastic figurine that represents their character. They register their mobile phone with game operators and create a character for their figurine, which then journeys through the town, meets and talks to other figurines, visits destinations, finds and uses objects, resolves dilemmas and undertakes missions. All of these actions are controlled by sending messages and commands from a mobile phone. At the same time players receive messages from the game. These inform players of pre-scripted events, provide scene-setting information, reports on health, notification about arrival and the presence of other players, and convey tasks, missions and dilemmas. The 24 hours of virtual game time are mapped onto 24 *days* of real time. Thus it unfolds in the background of players' ongoing lives and they may only need to exchange a few text messages each day, though there can be periods of more intense interaction.

The game commences each day at 11:00 AM and runs for 10 hours until 9:00 PM. An initial update message may be received at the beginning of the day but, aside from this, messages may pass to and fro at any time. A consequence of this is that people playing the game may receive messages from the game and interact with it in any situation: at work, at home, out and about, perhaps whilst traveling. This is one of the principal advantages of looking at this dataset. The game has no set place or time in which play may occur and may serve to disturb action in any setting. It is therefore capable of prompting a particularly rich and diverse range of possible situations that demand players to make their actions accountable.

Gathering data to illuminate interruption handling in players' everyday lives was challenging, as they were physically distributed and having an ethnographer 'hang around' with particular players over the duration of the game impractical. Consequently, we recruited one of our own to conduct in depth observations of the everyday character of gameplay. That person is a professional ethnographer, though more importantly for purposes of the

research is the fact that he became an active participant in the game, is a husband and father, aged 46, and that he and his wife have 4 children, one of whom, a sixteen year old boy, also agreed to participate in the game and take part in the study. What is significant about the ethnographic study is not that it is of an ethnographer and his son's conduct then, but that it is of gameplay done by two players - respectively called Tog and Celtic24 - in the context of the everyday life of a *family*. Ethnographic data gathered consists of video recording of registration, audio recordings of player and family conversations, and ethnographic fieldnotes compiled throughout the game.

Supplementary data to reinforce findings from the ethnographic study and assess its broader applicability amongst gamers was also gathered from two groups of 5 friends who were recruited at registration, where video recordings were made of their initial gameplay. They were then contacted from time to time during the course of the game for non-structured telephone interviews, which were tape recorded. One of these groups (all around 18) chose to play with just one in-game character and manage it collectively via a single nominated phone. The other group (all around 15) chose to play individually.

Throughout the course of the game the players were polled for their willingness to contribute to the research. The only criterion adopted for contact was that they be active players. This led to telephone interviews with a further 7 players, ranging in age from 18 to 45 across a range of different work and habitation circumstances (e.g. receptionist, museum attendant, software designer, talent scout, in family, shared household, living alone). It turned out that 3 of these players had actually first met at the registration session and decided to play the game together, maintaining separate contact via email and telephone.

In addition, as all incoming and outgoing messages were logged by the system as a matter of course throughout the game, the logs were reviewed and, where appropriate, used as a resource to prompt discussion in interview. Through the accumulated data we were able to uncover *a range of accounting practices* amongst co-players, amongst members of families, friends, and work colleagues, at home, at work, whilst traveling, and out socializing.

It is worth noting that we make no claims of 'representativeness' for the study's findings. Such issues derive from survey-based methodologies and are not universally applicable. Ethnomethodology is not in the business of offering generic accounts, but rather attends to the incarnate social organization of situated action [40]. In other words, it uncovers social organization at work in particular settings, occasions of action, and situations. If we look at other settings, occasions, and situations, we may see the same organization of action at work: one needs to reflect on the findings to answer that. It may be that we find another. Should we do so, then careful explication will add to the corpus of studies on interruption handling, just as

ethnomethodologically-informed ethnographies and analyses have cumulatively added to CSCW understandings of work, technology and organization.

COHORT ACCOUNTS IN DAY OF THE FIGURINES

Our purpose here is to consider interruption and accountability in relation to how playing *Day Of The Figurines* was handled in the course of people's ongoing lives. Here the accountability of gameplay is highly nuanced, according to the *different cohorts* being engaged with. Cohorts could be 'all those playing the game', 'my work colleagues', or 'my family'. However, in the context of the family, they could also be 'us kids', or in the context of the game 'Me, Ginnie, Mike, and Dave' or some other group of friends who are playing together.

It is worth reiterating, before exploring specific accountabilities arising during the course of the game, that from ethnomethodology's point of view people are always engaged in accountable conduct, though they rarely have cause to comment or remark upon it [15]. Interruptions are set against this taken for granted background and may draw action into explicit account. Mobile phone use is permeated by the ordinary accountability of action and shapes cohorts understanding of gameplay. It is not as if, from other people's points of view, the fact that you are playing a game on your mobile phone by sending text messages is visible and distinctive. Rather, for others, you are *not* visibly playing a game by using a mobile phone and you are thus expected to proceed in a fashion appropriate to its ordinarily accountable use.

There are a range of noticeable but nonetheless ordinarily accountable ways of engaging with texts on mobile phones that ride upon a presumption that people will have some valid reason for being *attentive to their phones* - of which playing a game is just one, less likely, possibility. Thus checking one's phone for messages when entering some place and sitting down could be ordinarily accountable in terms of it being a while since you last checked your messages and it being possible you've missed one coming in. Checking again repeatedly, prioritising checking one's phone when returning from elsewhere, and so on are all ordinarily accountable in terms such as expecting a message from someone. We routinely see people engaging in such activity and where it is not taken to be remarkable in itself, we do not treat it as needing to provide us with any *special account* as a consequence.

The caveat here is critical. The recognition of appropriate or remarkable use is something that is highly situationally nuanced and itself varies across different cohorts, as we shall elaborate in the following sections. What we are speaking of here is ordinarily accountable orientations to phone use and texting that might be seen to hold for very large cohorts such as 'strangers' or 'passers by'. With more specific cohorts, who either know something more of what it is you are engaging in or something more of how you yourself routinely use your phone and may be expected to

use it, these behaviours may be treated quite specifically as disturbances and open to account. Thus, for many of us, engaging in these kinds of routine checking behaviours illuminates that we are not amongst more closely managed cohorts and answerable to more specific expectations. Indeed, 'doing checking' is one way of rendering visible the assumption that we are *amongst strangers*.

The Ordinary Reportability of Gameplay

For those cohorts who are aware that gameplay is being engaged in, its *ongoing occurrence* is not especially remarkable. The notion of 'playing a game' sits in the background and may be readily invoked to account for the continual sending, receiving, and replying to texts in a repeated and relatively intensive fashion, with only short periods of inactivity in between. Thus both Tog and Celtic24 were seen to directly respond to what was happening in the game on several occasions without this inviting any special interest from those around them. For instance, Tog received the following dilemma:

07:33pm, a soldier gesticulates at the coins in his hand and points at you. Do you A: Make it clear you have no change B: Smile helplessly C: Take some change?

Tog was sat with the rest of his family drinking tea in the living room when he received this. Upon reading the dilemma he paused over it, read it several times, and rubbed at his face in ways one might routinely associate with trying to make some kind of decision. Yet none of the family took any interest in his behaviour whatsoever – 'playing a game' provided sufficient account to these cohorts to understand what was going on and to make sense of Tog's actions. As Tog rarely received text messages in the ordinary run of family life, responding to an incoming message in this fashion would almost certainly have invited some kind of interest were his cohorts unaware of the situation. Messages from a game, by contrast to 'real' messages that provoke 'real' decision-making, are of *no account* in the ordinary run of everyday life.

Cohorts' everyday orientation to 'playing a game' extends in other ordinarily accountable ways. For example, Celtic24 was stood in the kitchen talking to his mother when a message came in on his phone. He inspected the message and then said to his mother, "Two lovers have been found dead in the cemetery" to which she replied: "Oh really? Are you going to eat anything today?" One might wonder how this could be an ordinary and appropriate response to the news that two lovers have been found dead in the cemetery? Clearly both parties orient to the news as something that is reportable within the mutually understood context of 'playing a game' *and* that it is of *no* 'real' moment for the other people around the player: it does not concern them.

Recognizably Appropriate Accounts

The reportability of the game to different people is quite fine-tuned and illustrative of how accountable courses of action may differ across cohorts. On one occasion Celtic24 made it clear that he was a member of the same cohort as

his father through the unqualified utterance "I've just won a goldfish" as he passed him on the stairs. The method of presentation here speaks volumes: not all utterances have the quality of what Sacks [37] called 'first-topic status', which invoke topics seemingly out of the blue. Members of the same cohort of players with a similar orientation to an unfolding course of play can easily enough recognize the sense of what is being said and treat it as a conversational opener. For anyone else, even his brother or sister, Celtic24 would in all likelihood have been obliged to explain the remark more fully, demonstrating its initial adequacy in its own right as an opening comment. Thus it can be seen that managing accountability across different cohorts is not just a matter of managing content. Instead it is a *methodological matter* where the very mechanisms of interaction employed by participants make visible appropriate forms of reportability and account.

This can be seen in another way. On one particular day Tog had not received any start of day message from the game, despite having changed location just before the close of play the previous evening. He sent the 'UPDATE' command to the game periodically throughout the day, but received no response. In the end he went to his son's bedroom, knocked on the door, and, went in, whereupon the following exchange occurred:

Tog: Have you heard anything from the game at all today?

Celtic24: Errm. I think I had a message first thing, but I've not had any others for a couple of hours.

Tog: I'm not getting anything at all, even when I say 'update'. I think the game server must be down.

Tog and Celtic24 did not normally seek one another out to talk about the game and the two did not presume that they might go and find one another specifically just to tell them the latest thing that had happened. In the above instance matters of the game are taken to provide warrant for disturbing a co-player because of observable gameplay troubles. Furthermore, the account *of* the troubles encountered by Tog provide an account *for* the disturbance itself. This is similar in many ways to how another player, Boyd, was able to directly telephone both Cyborg Barbi and TV Guy, whom he had made friends with during registration, for assistance upon becoming mortally ill in the game. How would it have been, however, if Tog had interrupted his son just to say "I've won a goldfish"? Or for Boyd to phone up Cyborg Barbi to say the same? This would beg an inquiry into what of significance within the game was implied by the disturbance. Interrupting people in the real world with matters of the game, even when they are co-players, does *not stand as adequate* in its own right.

That there are reportably adequate grounds for disturbing other players, such as when troubles are encountered, needs to be set against how the same circumstance might pan out were the matter reported to a *non-player*. If Tog had tried to engage in this interchange with his wife, aside from the fact that she would not have been able to verify his suspicion

about the game server, how might she have seen the account of him thinking the game server is down as being adequate for *interrupting her activities?* To just seek her out to tell her the game server is down would demand a further interchange regarding on what grounds it might be she should care about or be interested in this.

This is what seeking out and interrupting other cohorts does: it makes visible an assumption that the other person has a *sufficiently similar orientation* to the matter that they can see it to be of potential moment as well. Thus, accounts to other members of the gameplay cohort need do no more than make visible the facts of the matter – e.g. troubles encountered - and the sense of the interruption is understood without further probing. Accounts to other kinds of cohort – such as family members - must move beyond a presumption of the facts of the matter being sufficient and explain the grounds upon which the presumed salience of the account stand to make the sense of the interruption recognizably self-evident and appropriate.

Recognizably Inappropriate Accounts
In many cases it is one's interactions with technology that is most immediately open to account should it cause disturbance. Players at home may have other members of their family engaging in something with them as a message comes in. Players at work may have to respond to a dilemma within a certain time yet be about to go into a meeting. Players in the pub may be trying to manage a dialogue in the game whilst in conversation with their friends about completely different matters.

We have already discussed how engagement in texting on mobile phones has a range of natural accounts available for it. At the same time, there are situations where attention to incoming messages on one's phone or their composition can generate the need for account. Thus at times of urgency, heavy workload, teachers or students actually in the course of lessons, mid-conversation, in the midst of delicate or messy operations, whilst making love, and so on, taking time out to look at one's phone is routinely presumed to be open to comment and even moral sanction. Furthermore, it is often the case that being attentive to text messages is subject to quite different accountabilities to those holding for an actual call on the telephone. Here is one such example from our observations:

Tog and Celtic24 have just finished lunch in a café with Tog's niece, Christine, and her husband and small child. They were previously in an adjacent playground whilst Christine's child played on the swings. They stand to leave the café when Christine says: "Where's my bag?" Everyone looks around in the café and then heads off outside to look in the playground whilst Christine runs back to her car. Tog's phone makes a noise as a text message comes in. He leaves it in his pocket without even looking and does not look at the message until several hours later as he is leaving Christine's house.

Tog might have checked his phone as soon as the message came in. However, it is clear that to check an incoming text message at a *moment of crisis* when a bag has been mislaid and everyone is supposed to be looking for it would be a highly accountable matter. Reasonable accounts might exist: Tog may be expecting some urgent communication by text that everyone already knows about, for instance, but in the normal course of events our engagement with texts is not ordered such that they take priority in this way. At the same time, had it been a physical call on the phone with the phone ringing, Tog *would* have been accountable for *not* answering it. There is standard orientation to phone calls that they operate as summons. To ignore a summons, even at a moment of crisis, may demand an account, depending, of course, on the nature of the crisis. Tog might well have said to the caller that he could not talk at that time, but there would not have been the same need for explicit account as there would have been if he had looked at the text message. So we might observe here, as a further twist on prior observations, that cohorts recognize inappropriate accounts – answering a text when more pressing matters are to hand – and reciprocally that there are good accountable reasons *for non-engagement*.

Ordinary Engagement
Many activities that might seem ordinarily accountable to the casual observer may need explicit account amongst cohorts such as family, friends, and colleagues. Amongst all of these cohorts someone's usual interaction with their phone is known and taken for granted, such that changes in how that interaction is conducted could be called into account. Beyond this, there are many expectations about appropriate engagement with various technologies, including mobile phones - and more specifically texting on mobile phones - that are to do with how those particular cohorts organize their everyday affairs. Members of the cohort take for granted that other members of the cohort will orient to these expectations in a similar way. Let us take a selection of these, starting with matters of 'known habit' amongst participants in the game and their cohorts.

A) Frequency. A number of the players commented that they were not habitual 'texters' and that the sudden increase in their attention to incoming texts and composition of outgoing texts was remarked upon by their families. In a further twist upon this Tog, who was the primary source of observation in the game, became directly accountable to his two youngest children for not looking at a message as soon as it came in. Every time the phone "bonged" in their presence they chorused, "Dad, you've got a text."

B) Configuration. With respect to the latter observation, it was noted that Tog changed the preset tone for incoming text messages on his phone shortly after he began playing, stating that he wanted a sound that was "more noticeable". However, the change in tone was also immediately commented upon by his family and friends. Other subtler changes in configuration to accommodate the game, for instance the handling of the address book and the storage of texts, may also become visible to external parties on occasion through changes in habit. Tog, once again, was

called upon to account for his sudden attention to cleaning out his incoming text messages on a regular basis.

C) Timing. Where people's mobile phone habits have been previously observed and are known by cohorts, incoming and outgoing texts at times where texts would usually be unlikely are also called to account. In the case of Tog and his son, Tog habitually receives texts only from other family members. In the evening when all family members are already in the house an incoming text is very unlikely and therefore open to comment. For the first few days of play, then, text messages coming in during the evening were noticed. 'Noticing' refers to other members of the household looking up enquiringly when the phone made a sound. Tog's response to these glances was along the lines of "it's okay, it's just the game". Tog's son, however, Celtic24, is a habitual user of text-messaging. Celtic24 was also receiving messages from the game in family situations but was largely ignored when he interacted with his phone. Thus, there were *differential organizations* to the accountability of texting even within the same household based on known-in-common and expectable patterns of use.

D) Prioritization. A final matter of habit, that also impinges upon cohort expectations, is the observable importance people usually attach to text messages when they come in. A reported feature of how players were playing the game that was also visible in direct observation is that they were sometimes actively waiting for messages to come in. This was made visible to other people around them by the fact that they would look at a message the moment it came in if possible. This was a remarkable and accountable feature to others by virtue of this *not* being how these individuals normally handled incoming texts, often holding off looking until after current activities were complete or when otherwise checking or using the phone. As one player, Shinji Ikari, put it regarding the impact the game was having on his wife:

"What it did mean was that while we were doing stuff every now and then I'd pick up the thing and send a quick text message, put it down or go 'Ohhhh' then send an even quicker text message."

In this case he was clearly finding himself accountable to his wife for how he was prioritizing his use of the phone when they were "doing stuff" together.

Accounts and Local Organization
Whilst it was possible for players to find within the circumstance of being a player in the game some scope for accounting for an out-of-the-ordinary prioritization of their use of the phone, there is a local organization to people's engagement during various activities that has a powerful *moral aspect* and it cannot simply be set aside because one is currently playing a game. Mealtimes in some households, for example, are a place for the banning of mobile phones. In others their use at such times may be wholly acceptable. Indeed, this can be yet more fine-tuned. Tog, for instance, was observed to postpone checking on a message that everyone heard coming in during a meal at his niece's

house where he was currently a 'guest'. However, he was subsequently a 'guest' at a friend's house where his involvement in the game had already been heavily discussed. Here he was able to check on an incoming message at the dinner table the moment he heard it coming in without feeling this was 'improper' in any way.

The study of Tog and Celtic24 was particularly rich for the ways in which it revealed the situationally nuanced character of these orientations. So, on one occasion the whole family were sat down to watch a film together and Tog received a message and pulled out his phone, read the message, then sent back a quick response. At this point Tog was engaged in pursuing a mission in the game so he was receiving texts more frequently and motivated to keep track of them if possible. However, when he received and responded to a second text his wife was moved to comment:

"Are you watching this film or what?"

After this several more texts came in but Tog no longer removed the phone from his pocket to look at it. Nonetheless, on every subsequent occasion that a text was heard coming in other members of the family were noted to look his way, frowning.

Here then, we have not just a standard orientation to family activity being honoured but the nature of what might constitute a breach of an *orderly* phenomenon - watching a film as a family - being actively uncovered and articulated. This stands in contrast to several other occasions where Tog was observed to be sitting down watching TV serials with his wife, yet also engaging with the game without any hint of him being called to account for it. So the matter is much more exact than there just being expectations regarding what people do when sitting down to watch television. It was and is quite specifically a matter of there being a family event that informed how Tog was being called to account in specific kinds of locally organized events and occasion and otherwise regulating his conduct to comply with the expectations cohorts have of them.

Accounts and Organizational Expectation
Local organizational expectations extend beyond the home. In the workplace, for example, cohorts often sacrificed gameplay, commonly saying that they were "too busy" to attend to the game. The extent to which this was oriented to as sufficient justification, however, was subject to considerable variation. Boyd, for example, had just started running his own business and said he was pretty busy with that. Little Bray had a fairly stressful job in media and continually de-prioritized playing the game in relation to her work. Cyborg Barbi and Shinji Ikari, by contrast, both had jobs, one as a gallery assistant, the other as a receptionist, where they claimed they had long periods where engagement with the game was perfectly possible whilst at work.

What is important here is how different kinds of organizational commitment and expectation allow leeway

for different kinds of accountable engagements *during work time*. Being busy or otherwise is a very gross kind of account that works well enough when accounting for one's actions after the fact. However, just as was the case amongst cohorts such as family and friends, specific situations at work demand a range of judgements regarding probity and disruption. Texting, especially to a game, in the course of a meeting where one is expected to be an active participant is directly open to account. Breaking off from interacting with a customer in order to read and respond to a text would be similarly problematic. As TV Guy put it,

"Messages have arrived during telephone conversations and I've been aware of them arriving and I've made the conscious decision not to look because I knew I would distract myself."

Being under pressure to have a report sent out by the end of the day and then being found to be interacting with one's phone might also invite comment. However, as in home environments, just what priorities apply here-and-now are always subject to the specific work situations people find themselves in. Here is Cyborg Barbi talking about how she handled texting during the course of her work:

"Just texting really furtively to be honest… I text really fast because I send a lot of texts anyway and the nature of my job is that it's quite easy to sit and text without anyone noticing. I work in a different room each hour, making sure no-one damages anything and talking to the public about the art and some days it's really quiet."

For Cyborg Barbi it is not a matter of her texting at work not being open to account, but rather the fact that she can render the texting relatively invisible so that it is minimally disruptive to the pursuit of that work. She could be called to account but tries to manage it so that she is not. TV Guy, on the other hand, whilst certainly oriented to texting being an issue when engaged in customer-facing work, was not much concerned about the visibility of his texting to his other work colleagues, commenting that,

"One of the nice things about the game is that it doesn't actually take that long to respond to a particular message - so as long as you choose your moment you can be fairly responsive."

Looking at the management of accountability to cohorts outside the game elaborated a range of distinct concerns. First of all players were governed by all of the ordinary everyday accountabilities that cover mobile phone use. However, we have also noted that some of the accountabilities relating to texting are quite different to those associated with the actual use of the telephone. Thus, and for instance, one is ordinarily licensed to answer a phone as a summons, but not to treat an incoming text in the same way. Yet even texting is not all of a piece. What you do in the company of your family is not necessarily what you do in the company of your friends or your work colleagues. Furthermore just which family members, which friends, etc., can all make a difference. Beyond all of this, cohort accountabilities do not in any sense amount to a set of formal prescriptions. Instead, what accountabilities hold are entirely nuanced to specific situations and may even, as we saw above, still be in the process of being uncovered as

new kinds of disturbance are encountered for the very first time. Nonetheless, specific features of the ordering of the day-to-day world do present themselves as dimensions along which the accountability of gameplay is made visible and articulated. These most particularly relate to matters of frequency of interaction, the configuration of the technology itself, the timing of interaction, and how the gameplay is prioritized in relation to the other activities one is engaged in and the cohorts one is engaged with.

DESIGNING FOR DISTURBANCES

Current interruption research has a tendency, despite its breadth, to make some core assumptions regarding interruptions. Borne of a strong work perspective, interruptions are typically seen to be negative in some sense, although positive elements are also indicated. Also implicit to most current endeavours is an effort to make the local characteristics of how specific interruptions are handled tractable for design by creating generic frameworks that classify specific instances as a case of a, b, or c type of interruption occurring in contextual categories x, y, or z. Whilst this effort to make the hugely diverse body of possible interruptions somehow recognizable to systems so that they can provide tailored support is wholly comprehensible and sterling work has already been undertaken in that direction, we would like to suggest that there might be other strategies one could adopt.

First of all we would like to point to the finely-tuned orientations to cohorts we have discussed above. The acceptability of an interruption and the way it is consequently handled has a highly *local specificity* to it that pretty well precludes any in principle judgements regarding its positive or negative character. At the same time contextual assessments that fail to take into account specific cohort considerations will always somehow be inadequate, with their efficacy turning upon a fortunate coincidence between the judgement of a system and local concerns. This too seems less than ideal.

However, the analysis presented above also makes something else quite clear: despite the burgeoning number of ways interruptions can arise across all kinds of different circumstances, *people are already expert in how they handle them*. It is not as if they do not know themselves whether they are events to be welcomed or railed against. Nor are they unequal to assessing where their accountabilities might lie. Whilst these observations may in themselves seem obvious we feel they present us with some important and overlooked possibilities:

- The first of these is that, for all of their highly contingent character, people exhibit identifiable orientations towards how they handle disturbances.

- The second is that the actual ways in which disturbances are handled are possessed of methodical characteristics.

This being the case design is not therefore condemned to prior suppositions regarding the desirability or otherwise of

interruptions. Nor is it obliged to rely upon assessments of context of varying levels of crudeness. Instead it would seem there is scope for pitching design not towards tackling interruptions themselves, but rather towards *supporting peoples' management of interruptions*. Such an approach might base itself upon the provision of technologies that,

a) facilitate the embedding of the technology in the accountable orientations at play;

b) respect and support the accountable practices through which disturbances are made manageable.

Instead of trying to second-guess how the technology should present its interactions to all the different possible cohorts, the injunction instead is to enable people to handle cohort accountabilities for themselves and by augmenting the methods they ordinarily and naturally employ to do so.

While research in this area is far from being a 'done deal', it is worth considering what can be said on the basis of the above analysis of how people manage their accountability during the playing of text-message-based pervasive game. One thing that is immediately apparent is that, while situations hold where gameplay is certainly inappropriate, it is far from the case that being disturbed by the game was taken to be undesirable or negative. To simply bury or minimize disturbance, then, may not be an effective solution. What the practical management of accounts does turn upon is an ability to effectively articulate *to relevant cohorts* the particular grounds upon which choices of engagement are made.

It is an ordinary feature of our intersubjective lives that the need for direct account rarely becomes necessary. As is often the case, we can see in the particular circumstances to hand that the appropriate ways to proceed have been adopted. Naturally, this relies upon a certain *transparency of circumstance*, which technologies can serve to either support or obfuscate, the latter being more often the case. How does one tell whether the incoming text is from your teenage daughter who needs collecting from a venue that closes in fifteen minutes with her having only a few pence left on her phone card, or a message saying you are on your way to Kath's café, without actually inspecting the phone?

Recent work by Chalmers et al. [9] has stressed the potential viability of making the 'seams' in technological disjunctures visible and available as a resource for ordinary reasoning. One possible approach towards designing for disturbances might then be to find similar ways in which to *foreground* the grounds of disturbance so that they are available and transparent for the conduct of ordinary everyday intersubjective reasoning. It is important to appreciate the subtlety of the point being made here. The thing that might require foregrounding is not necessarily the disturbance itself, it is the reason why disturbance might be happening that needs to be *made visible*. This reduces the need for overt accounting practices and makes it easier to articulate accounts where necessary.

The foregrounding of the grounds of disturbance will also require differential management. For instance, we have seen that not just people themselves but the various cohorts of which they are a part have expectations about how often, for how long, just when, and even in what fashion a particular technology will be engaged with. It is against this expectation that accounts are delivered when disturbances arise. So not just the grounds of disturbance themselves but *how they are displayed* such that their visibility can be contingently managed needs resolving. Teenagers are not necessarily going to be enthralled with the prospect of someone flirting with them being made available to their parents at the dinner table, whatever the technology.

Here, then, we have two classic design considerations:

- What do you make available?

- And how do you make it available?

The problem with the 'what' is one of understanding what is enough. In co-present interaction the secretary bursting through the door during an important meeting to say to her boss "pick up the phone now" is not enough. Bursting through the door to say "I'm sorry to disturb you, sir, but your wife is on the phone from the hospital" may well be adequate for all parties to find both the interruption and its subsequent handling intelligible.

Bursting through the door and saying "there's a woman on the phone who says she's your wife and she's told me to say that she's phoning from Welsby Hospital and that your son fell from the climbing bars during a gym lesson and that they phoned her from the school because he had to be taken to hospital and she's wondering whether you could pick up the phone and talk to her" is probably starting to edge on there being too much. There's both an *economy* to these things and *a way of doing them*. For instance, it might well be that, during the course of a meeting, to not say "I'm sorry to disturb you", could itself be problematic. This, of course, is beginning to shade into the issues relating to 'how', where the problems are manifold. It's not just that different circumstances require differential presentations of disturbances but that there are differential grammars of presentation as well.

CONCLUSION

We have explored through detailed analysis of how people engaged with a text-message based pervasive game in the course of their everyday lives make interruptions accountable to local cohorts. This has led us to propose ways of stepping beyond current approaches to interruption handling design by focusing upon making the grounds of disturbance visible and available to practical reasoning. Clearly this will still not be straightforward for designers. However, just because a job is hard, does not mean it is not worth doing. What we are suggesting is that there is value to be gained from grounding approaches here in how people accountably orient to and manage interruptions and that this will, at the very least, allow us to step beyond constructing

technologies for interruption handling that are largely based upon work-oriented presuppositions and the pre-figuring of contextual categories.

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