Direct video observation of the uses of smartphone on the move. Reconceptualizing mobile multi-activity

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ABSTRACT

We report on the development of a method for observing and recording the uses of mobile communications 'on the move', based on the combination of context-oriented recordings made with user-worn camera glasses with mobile screen capture data. We show how this allows the temporal organization of gaze switches (to and away from the mobile screen) to be observed and documented, thus providing crucial empirical information to understand how users actually manage mobile communication as well as other activities in everyday multi-activity settings. We report on the findings of an empirical study of smartphone use in transport situations. Being oriented towards multi-activity appears as a particular form of attunement to the potential sequential implicativeness of events occurring both in the navigation of mobile communication applications or the mobility environment, i.e. as possible occasions to switch the orientation of one's gaze from one activity-relevant field of activity to another.

Author Keywords
Mobility, mobile communication, smartphone, mobile phone, car, multi-activity, camera glasses, gaze switch.

INTRODUCTION

A recent video of a woman falling into water in a mall while texting on the phone went viral on YouTube[1]. It was used as a resource by mobile communication gurus such as Howard Rheingold to support their claim that the management of attention (the way it is done, our awareness of it, etc.) is a big issue in a today's world of multiple screens and mobile terminals (Rheingold, 2012). This concords with a line of dystopian critique originating in the early days of the mobile phone. This line of thinking criticizes not only the way mobile users become involved in mobile communication in urban settings but also their inability to cope with the demands of sociality in public situations due to this involvement. Unfortunately, little empirical evidence has supported such a debate. The reason is that the kinds of practices pinpointed deal with the way users manage their attention, locally, on a moment-by-moment basis, as situations unfold, and in a way that is largely non-reflexive. So neither traditional methods such as interviews and surveys, nor the big data quantitative approach based on the study of various use-related logs, are operative. We unavoidably need detailed video recordings of users' conduct in everyday situations to make sense of the situated practices involved in the management of attention. In this paper, our aim is two-fold. First, we wish to describe a portable method for video recording the uses of mobile phones and smartphones on the move. Second, we will use this method in an empirical study of the use of smartphones in transport situations to gain new insights into what the joint management of mobile communication and mobility, and more generally multi-activity, is about.

Video recordings made with portable devices enable the development of promising methods because they may 'follow' the user and record his visual experience. This constitutes a powerful way to obtain naturally occurring data regarding how smartphone users manage mobile applications in a manner that is sensitive to the context of use and to the other activities involved in at the time. This method is useful as it improves our understanding of multi-activity. Research on time-use distinguishes several forms of multi-tasking, such as 'simultaneous multi-tasking' or 'consecutive multi-tasking' (Kenyon, 2010). We use here the notion of multi-activity to account for the practical accomplishment of multiple streams of activity with different temporal organizations, that alternates phases of engagement and disengagement in embodied performances, for example while talking and driving (Laurier, 2000; Haddington & Rauniomaa, 2011). These researches have focused on video recording

[1] http://www.youtube.com/watch?v=Z8GmsKbB9h8

drivers' and passengers' behavior in cars and using multimodal interaction analysis by putting cameras in the automobile. Some of this work has explicitly looked at the way car users manage phone-related events (Esbjornsson et al., 2007; Haddington & Rauniomaa, 2011) or GPS-based information (Brown and Laurier, 2012) collaboratively. However, such setups are not adapted to other mobile settings, so one has to turn to more flexible mobile recording devices. Cameras following users along their mobility paths have been used in visual anthropology, where the analyst may visually 'shadow' and record the person's engagement in places and orally record his comments to produce a self-centered visual tour (Pink, 2007). If such set-ups are useful in understanding how mobile persons are engaged in places, they usually do not provide good empirical access to the persons' use of digital technology as they move. For that purpose, it is better to have the user wear or carry the recording device attached to his body in a mobile cyborg assemblage, reminiscent of Steve Mann's early experiments in the 80s and 90s.

There again, different recording methods provide different empirical data and support different types of analytical claims. When the camera is worn only on the torso of the user, it aims to provide a view of the context and a general sense of the user's body, without much access to what he might actually be gazing at or attending to. When the video recording is produced from the user's head, stronger claims are usually made about capturing, more or less accurately, the user's visual experience 'in action'. Oculometric methods are most precise because they record eye movements and fixation patterns (Yilmaz et al., 2006). They have also been applied to the use of mobile phones (Drewes et al., 2007), but oculometric devices are not easily portable and cumbersome to use outside the laboratory. Another approach is to ask the user to wear a single camera on his head, either on the subject's forehead (Omodei et al., 1997) or on specially fitted glasses, sometimes described in literature as 'video glasses', 'subcams' or 'camera glasses'.

Camera glasses have been claimed to enable the analyst to record the evolution of the subject's visual field in a situation and capture something of his subjective perspective (Lahlou, 2011). They have been used by several groups to study mobile phone uses in natural settings (Mark et al., 2001; Relieu, 2002; Figeac, 2012), either alone or coupled to log data analysis (Zouinar et al., 2004; Oh and Lee, 2005). But when camera glasses alone are used, they rarely provide a resolution of the mobile phone screen good enough to grasp the finer details of mobile use. It is therefore useful to complement this context-aware device with a

screen capture recording, for the latter will provide precise and independent access to the user's activity on the mobile terminal (Roto and al., 2004). Since we are interested in fine-grained data about how users manage the joint demands of mobile communication and mobility, we have decided to combine here the recording produced by camera glasses with the mobile screen video capture apparatus.

In this paper we will aim to show precisely how the contextual data provided by our dual recording system can document the analysis on the manner in which sequential aspects orient users towards the ongoing situation. This study of the temporal organization of activities helps to account for how users distribute their attention between mobility and mobile communication concerns, particularly in terms of how users are absorbed by the mobile phone screens. This sort of absorption is an additional step in the historical framework of the current social changes of attentional processes in our contemporary technological culture (Crary, 1999). It refers primarily to the capacity of users to switch quickly between phases of deep attention and hyper attention (Hayles, 2007). These switches between cognitive modes are sometimes interpreted as a distraction and a problem to be solved. From our point of view, this is a competence of the users that we need to better understand in order to design and implement new choreographies of attention, for example by building sustainable models for knowledge production (Gordon & Bogen, 2009). By describing the temporal organization of gaze switches, our video recordings allow us to do just that as we analyze this dimension of absorption and attentional processes. These data equally help to identify some local and situation-specific user concerns, while carefully avoiding hyperbolic claims that we would gain access to the user's subjective experience, or that what the analyst can 'see' through the camera glasses video is actually what the user 'sees'. We will show that such a recording method makes it possible to observe the temporal organization of gaze switches, i.e. the way the mobile user's gaze moves towards or away from the mobile phone. By combining the data from the camera glasses and the screen capture recordings, gaze switches can be documented and their occurrence linked to that of various events happening in the mobile interface or the larger situation. Such data can therefore inform us on how users orient to contingencies relevant to mobile communication as well as to other relevant streams of activity (such as mobility) on a 'moment by moment' basis.

To show the analytical usefulness of such an approach, we have done an empirical study on the uses of smartphones in transport situations. We analyze in detail here one particular case

in which we observe a driver trying to juggle the constantly evolving demands of mobile communication and traffic. This enables us to provide an empirically grounded definition of multi-activity as a particular way of being attuned to events in one stream of activity as opportunities to switch one's attention and involvement towards another relevant stream of activity, i.e. to what we call here their sequential implicativeness. This highlights the importance of the way in which the accomplishment of a given activity in a specially designed environment 'affords' events with possible sequential implicativeness (that is conducive to gaze switching). It will allow us to develop ideas about designing specifically for multi-activity settings, and more particularly, designing mobile communication application interfaces better fitted to the specific demands of multi-activity settings, as with mobile communication and transportation.

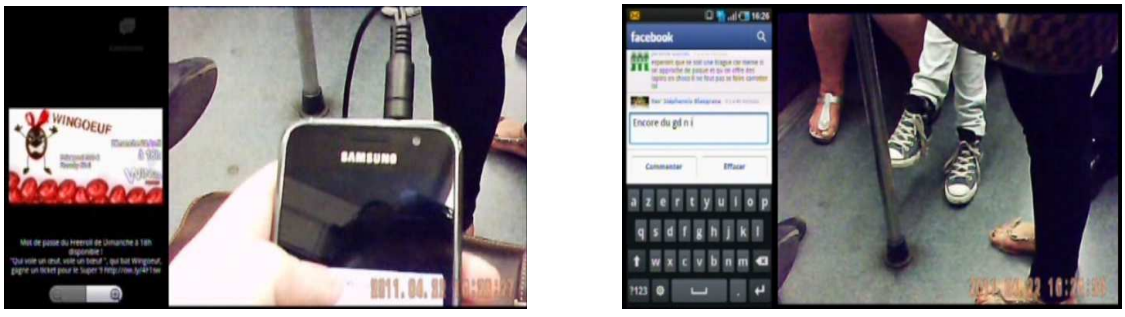
METHODOLOGY

Analyzing the uses of mobile communication terminals in everyday settings requires synchronized empirical data regarding both the use of the mobile device and the off-screen involvements and activities of the users. What we have done is to combine smartphone screen captures with the recordings of the contexts of use produced by user-worn camera glasses. To capture the screen-based activity, we have used a feature of Android-based smartphones that allows an audio and video connection. We have therefore coupled the smartphone with a light portable A/V recorder (Figure 1), a method initially developed to study mobile video telephony (Morel, Licoppe, 2011). When the system is on, it provides a recording of the changing mobile phone screen as the user performs various actions upon it, in the form of a video file.

Figure 1. A simple portable set-up to record the audio-video flux on Android-based smartphones

While such a portable set-up may provide rich detailed data on the 'natural' uses of smartphones on the move, it provides very little information on the actual contexts of use. We have asked users to wear camera glasses to obtain a video recording of the users' changing environments that can be synchronized to the mobile device screen capture data. Camera glasses have been used by various authors to gain a 'subjective view' of actors performing various activities (Lahlou, 2011). What was interesting to us was that the whole recording apparatus was portable and could be used to obtain data on the uses of smartphones in mobility settings.

However, the temptation for the analyst is to look at what the camera glasses record as the actor's visual perception of his environment. Yet what you get is not what he sees. Because of various constraints, it is often a rather crude approximation of human perception. The recording field is only about 40 degrees wide for standard commercial camera glasses, which is much narrower than the human field of vision. So the camera glasses data will not show what is available in the peripheral visual field of the human subjects. A consequence of this is that when different subjects are recording with camera glasses at the moment they are sitting and looking at their smartphones, the recording may feature the phone screen only partially (Figure 2a) or not at all (Figure 2b) in the video recording. In spite of all this, camera glasses are easy enough to use and wear to remain an attractive method to gather naturalistic observations on the move, provided we can somehow circumvent some of these limitations.



(a) (b)

Figure 2. In all images the screen capture appears on the left, and the camera glasses recording on the right (both have been synchronized). In both images the user is sitting and using the smartphone in his lap, which is partly (a) or not at all (b) visible.

Although what you get is not what the subject 'sees' and the data has to be treated with care in the analysis, camera glasses may still be used, albeit with a degree of caution. First, the analyst is helped by the small size of the smartphone screen. To look at the smartphone, the

user needs to orient his gaze in a rather precise direction, which can be reconstructed in the analysis and confirmed by the screen capture data (which shows what action he is currently involved in on the mobile interface), even if the smartphone is not actually visible on the video data. However, when the user looks away from the phone, it may become more difficult to infer what he might be looking at from the video glasses only. Hence, what camera glasses applied to the uses of smartphones on the move make visible are gaze switches, that is, when the users look towards or away from their smartphones. Such gaze switches are interpretable as switches between attending to the smartphone (which we may further document from the screen capture) and attending to other meaningful domains in the environment. Such data therefore provide a rich source of information on the way smartphone users may manage multiple involvements in actual public settings.

We will focus here on the joint management by users on the move of mobile social networking applications and everyday mobilities, especially automobilities, in order to demonstrate the potential of our research method. We will gather empirical data on gaze switches towards and away from the smartphone, and we will analyze their temporal patterning. Our research question will then be "Why this gaze switch now?" a) to show that there are some recognizable and understandable patterns in the temporal placement of gaze switches; b) to show that such patterns inform us on the way the temporal organization of the different relevant activities are used as resources in their 'simultaneous' management; c) to draw some implications from this for the design of technologies and applications that might be particularly fitted to multi-activity settings.

FIELDWORK

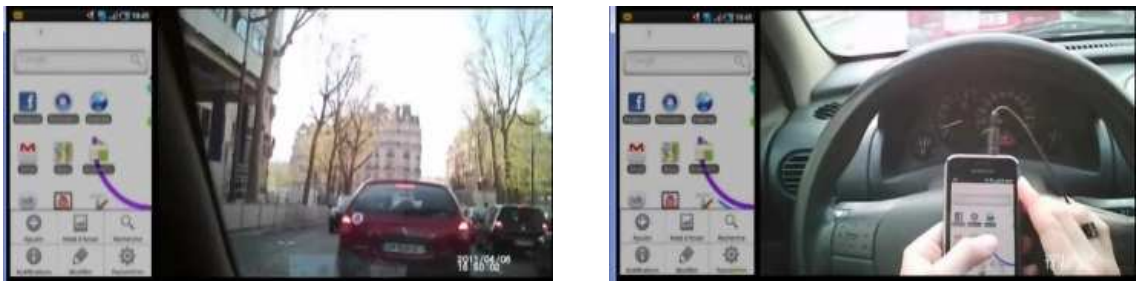
We have recruited 10 participants (5 men and 5 women) between 18 and 35 years old, who frequently use mobile social networking applications in situations of mobility, in particular Facebook. We asked them to wear camera glasses and record their mobile phone activities during their daily commuting for a period ranging from a week up to ten days. Two of them used their cars and the rest used public transportation. This provided us with about twenty hours of recordings. After retrieving the apparatus and the recordings, we synchronized the camera glasses recordings with the screen capture data to produce the kind of split-screen images shown in figure 2 and throughout this paper. This was our raw material for the analysis. We then scanned it to constitute collections of gaze switching events. In five

instances we showed one set of data to the user to elicit their own interpretation of it. In order to highlight the potential of our method in a limited space, we will limit ourselves to the analysis of car-driving cases and use the data obtained in public transportation as a way to enrich our findings.

Using smartphones on the move involves the moment-by-moment joint management of mobile communication and transportation. By using our empirical data on the occurrence and placement of gaze switches, we can understand some important aspects of the temporal organization of multiple involvements and shed some new light on the analytically elusive concept of multi-activity.

GAZE SWITCHES AND THE TEMPORAL ORGANIZATION OF MULTIPLE INVOLVEMENTS

In the example we will develop here, the smartphone user is a woman who connects to Facebook while driving. In the first set of data, she gets to a red light, stops (Figure 3a), looks down towards her lap and away from the road, places her smartphone on the driving wheel and launches the connection to Facebook, so as to check her list of recent posts on her wall (Figure 3b). Such conduct is illegal in France, but this is not the point here. What will interest us is rather the way she practically manages a dual orientation towards driving and using the Facebook application.



(a) (b)

Figure 3: a) Arriving at a red light behind the stopping traffic; b) Taking such an occurrence as an opportunity to gaze down, put the phone on the driving wheel and launch the Facebook application.

A red light is a constitutive feature of traffic management that is deceptively simple and familiar. It acts as an instruction for drivers to stop for a time that may be roughly anticipated by drivers with enough experience. It does not act by itself. As the speed bump studied by

Science and Technology Studies (Latour, 1999), the red light is the surface of emergence of a large and heterogeneous network, an assemblage of people and artifacts ‘delegating’ their agency to the traffic light while remaining at a distance. It is this networked infrastructure that is ‘agentive’ in the way a red light recognizably and forcefully instructs us to stop. As a visual and semiotic cue which ‘blackboxes’ the networked infrastructure to which it is co-extensive, the red light projects a predictable pause for the surrounding traffic and therefore offers a relevant transition point in the driving activity. It affords a recognizable and convenient slot for doing something else such as picking up one’s smartphone.

Such an artifact-mediated temporal patterning of periods of activity and inactivity is not restricted to driving. It is, for example, very common with mobile devices to intervene on the interface, and get a ‘circular progress bar icon’ (Figure 4), indicating to the user that the system is doing something and that until it is done, it is not responsive to the user’s actions. The progress bar does not ‘instruct’ the mobile phone user to stop as the red light does because it is grounded in another assemblage of human and material resources. However, like the red light, it projects a pause in the smartphone activity. It works as a ‘prospective indexical’ (Goodwin, 1996), signaling that some expectable delay is to be experienced before the expected action is accomplished and the interface becomes actionable again. It somehow ‘points’ towards the future moment in time in which this might happen.

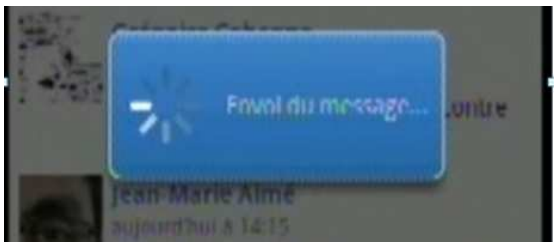
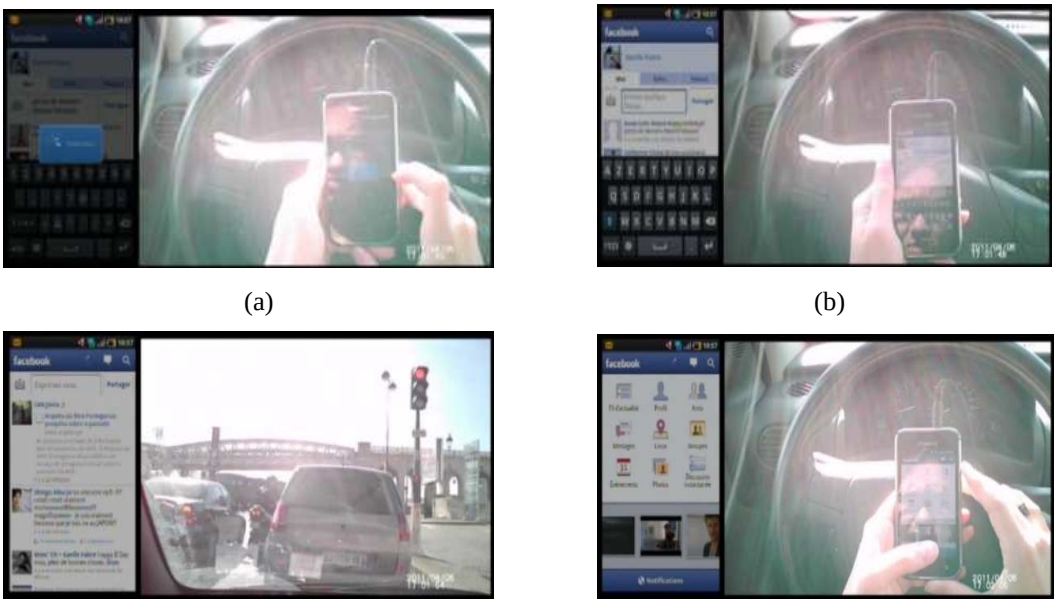


Figure 4: A typical visual display for the circular progress bar.

For instance, a few minutes after the first traffic light, our mobile Facebook user drives to another red light at which she looks down at her smartphone again. That she has left it on the wheel all along displays her orientation towards multi-activity: it is a way to construct an environment particularly conducive to this, making it easy to gaze swiftly at the mobile terminal and away while driving. At this new red light, she composes and sends a ‘happy birthday’ message to a Facebook friend. When she sends it, she gets the ‘progress circular bar’ icon (Figure 5a and 4).



(a) (b)

(b) (d)

Figure 5: a) Sending a message and getting the circular progress bar; b) the right hand goes to the right to engage a gear; c) the gaze moves up to look at the road and 'discover' that the light is still red; d) she immediately gazes down at the smartphone.

Her right hand moves towards the right to engage a gear. She takes that smartphone-related pause as an opportunity to engage a gear, an action the preparatory character of which shows evidence of her re-orientation towards the traffic about to resume. What is significant here is the way expectable pauses in the smartphone activity are also treated as slots to re-direct attention towards driving. Then she looks ahead to the road (Figure 5c) and sees that the light is still red. This shows that her engaging the gear was not related to any traffic event but indeed to the pause projected in the mobile communication activity. Characteristically, finding the traffic still at the stop is taken as an opportunity to gaze down at the smartphone again (Figure 5d), rather than continue on monitoring the road.

Such a pattern of systematic gaze switching at projected pauses in one stream of activity was a recurrent pattern throughout our corpus. When our smartphone users were in the subway, gaze switches away from the mobile phone usually occurred around the moments at which the train was entering into the station or leaving it, whether they were using their smartphones or not. Such a placement probably displays an orientation towards monitoring the progress of the train and the conduct of other passengers coming and going. When they were using their smartphones as well, whenever the circular progress bar appeared, they treated the projected pause as an occasion to gaze away from the phone and to the train environment, whether near a station or not, even if nothing was happening in the wagon at the time.

These observations show that the way we recognize unfolding activities as occasioning and projecting moments of activity or inactivity is a key resource in the management of joint activities. More generally it provides us with an original way to empirically grasp what the experience of multi-activity is about. We can thus pin down an elusive concept which is usually understood either in its commonsensical definition of doing two things at the same time (which at a fine-grained level is almost never the case) or as the limiting case of such an extreme fragmentation of tasks that switches between activities are so frequent as to become indistinguishable (Kenyon, 2010). With our data, we can say that an orientation towards multi-activity becomes manifest when projectable pauses (and possibly other events) in a given stream of activity are systematically oriented to as opportunities to gaze away towards another domain of the environment, relevant to another activity. In that sense, mobile Facebooking and driving, or even mobile Facebooking and taking the subway, are experienced as multi-activity in our corpus. Conversely, being absorbed or engrossed in an activity can be glossed as a tendency to ignore projected pauses in the ongoing activity and remain focused upon it. This tendency may be relevant for situational reasons, as in the example in which Mobile Facebooking on a couch becomes engrossing. It may also be relevant as a way to assert cultural identities, as with Malayan peasants for whom displays of haste are unseemly. In this latter case, postponing new activity demands to the next day is the proper social thing to do (Raybeck, 1997)..

Let us note finally that the orientation towards multi-activity in that sense is usually displayed in the organization of the body and the environment. Leaving the connected smartphone on the wheel when driving, or on one's lap when riding the subway, are ways to create an embodied spatial-material arrangement particularly conducive to swift and frequent gaze switches between the smartphone and the mobility-relevant visual domain.

TEMPORAL MISMATCHES IN MULTIPLE STREAMS OF ACTIVITY

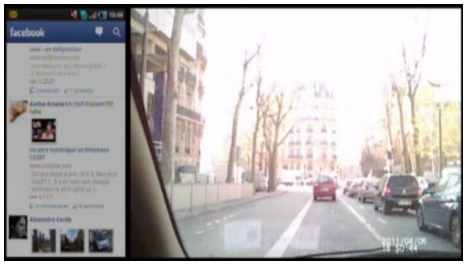
An orientation towards multi-activity (in our case, mobile communication and transportation) makes the normal 'messiness' of urban environment a constraint and a resource. Urban environments have been described as 'messy' to account for the way they are crisscrossed with heterogeneous socio-technical infrastructures and occupied by urban denizens who have been thrown together there and must behave accountably with respect to one another (Bell

and Dourish, 2007). Such messiness involves bringing heterogeneity and contingent eventfulness to the everyday urban experience. One consequence of this is that for a user engaged in different activity systems, there is no reason for a relevant transition point in one given activity to occur at the exact moment another stream of activity demands action. Different activities will generally project different temporal expectations and mismatched sequential opportunities. We have seen an example of such routine temporal mismatches in the previous section. The driver at the red light who takes advantage of the pause in mobile screen activity after sending a message (Figure 5b) finds the traffic light still red when she looks up (Figure 5c) so she looks down at her mobile phone again (Figure 5d). Being competent at jointly managing the demands of mobile communication and mobility (and more generally any kind of multi-activity) shows one's capacity to handle and minimize the potential consequences of temporal mismatches, so as to perform all relevant activities reasonably well with respect to the demands of the situation.

Such phenomena occur at a micro level in the details of the way the ongoing situation unfolds. They often elicit responsive conduct, which is not reflexive and thought about. This is the reason why video recordings of naturally occurring situations such as the ones we are providing here are required to provide better understanding based on observation. For instance, let us return to our mobile Facebook user who had just come to a traffic light and used this as an opportunity to launch Facebook on her smartphone (Figure 3). When the traffic resumes at the green light, her gaze can be seen to remain on her smartphone for a lapse of time and not immediately raised towards the street ahead, even though cars visible in the camera glasses (and even more so in her peripheral vision) have started to move (Figure 6a). That her response is noticeably 'delayed' is not just the analyst's opinion since independent evidence of this can be found in the data itself: a driver in the next lane takes advantage of the gap in front of a car created by her delayed response in order to change lanes and take her 'slot'

(a)

(b)



(c)

Figure 6: a) The driver is scanning down her list of Facebook posts. The sudden motion of surrounding cars is detectable in data through the side window though not visible in the picture; b) she eventually looks down, and a large opening is now visible before her car, materializing the delayed character of her response; c) the black car on the right 'jumps' into the gap, before she eventually starts to move her car forward again.

The materialization of such a delay shows how using a smartphone while driving may have consequences on the driving performance. Can we get one step further and provide a more precise interpretation of the reasons for such a delay? This is where the screen capture data comes in useful. At the moment the light turned green, the driver was in the midst of a scan of her list of Facebook posts: she was scrolling down with her finger, from the most recent (at the top) to older ones further down on the touchscreen. It is impossible to say, on the basis of the empirical evidence alone, whether or not she was looking for a specific post (goal-oriented activity) or just waiting for some post on her list to catch her attention (environment-driven activity). Whatever the case, what is significant is that the visual and pragmatic structure of the list does not offer obviously recognizable relevant transition points, the occurrence of which could be taken as an opportunity to gaze away and reorganize one's involvements. One may just scan down on and on until an attention-catching post has been attained, without the list in itself affording any generic and eventful asperity. In the case of a significant event happening outside of the screen, which is at that moment the focus of the visual attention (such as a light turning green), there is a fair chance that the user might remain absorbed in the scanning activity for an extra moment through the sheer inertia of focused attention, even though these 'outside' events are demanding some kind of response. Hence the kind of delay we observed when the traffic actually resumed.

Our research methodology not only allows us to observe the way users manage multiple and temporally heterogeneous involvements, but it also provides us here with another grip on the concept of multi-activity. Situations of multi-activity are situations in which users are attuned to the potential sequential implicativeness of events. Yet they are also situations in which temporal mismatches in the occurrence (or projected occurrences) of meaningful events are

expected to occur, to be recognizable as such, and to be consequential with respect to the joint accomplishment of the relevant activities. In our example, the delay in the resumption of driving is materialized by the 'gap' in the line of traffic in front of the observed driver. It is made consequential by the conduct of the driver on her right who immediately 'fills' the space. The expectability of such a sequence is perceptible in the fact it is not noticed or topicalized. It is treated as unremarkable. Even such a routine occurrence provides evidence for the claim that using a smartphone while driving is a form of multi-activity that is potentially consequential in line with social and legal concerns.

We do not claim here that all mismatches and discrepancies in the occurrence of relevance transition points are necessarily detrimental to the accomplishment of the relevant activities. We have mentioned above how at a further traffic light the occurrence of a pause in the mobile communication provided the occasion for the same driver to engage a gear before the light turned green, thus displaying her orientation towards multi-activity (i.e. systematically treating pauses in one activity as opportunities to switch one's gaze and/or involvements). The accomplishment of such preparatory action is potentially useful and certainly not disturbing with respect to the impending resumption of traffic. The actual meaning and significance of temporal mismatches in the occurrence of relevant transition points cannot therefore be defined a priori. Such meaning is constructed locally; it is situated and contingent to the details of the unfolding situation. Being a competent user of Facebook on the move relies on being able to manage the consequences of such potential mismatches as smoothly as possible.

CONCLUSIONS

To solve the complex problem of observing the uses of mobile communication on the move, we have developed a portable recording apparatus, based on the combination of camera glasses (worn by the user) and the recording of his mobile terminal activity as it appears on the mobile device's screen. We have shown how such a method allowed observation of two kinds of phenomena: a) gaze switches to and away from the mobile phone (and how they are timed with respect to other perceptible events in the situation) ; b) fine-grained gestures and embodied conduct related to the handling of the mobile terminal and mobile applications in everyday transport situations.

We have tested this methodology on a sample of mobile users commuting between home and work (by car or public transportation). The observation of gaze switches appears to be a powerful resource in understanding how users try to manage the contingent demands of the various activities they are engaged in. Based on the way users treated projected pauses in the mobile communication or transport activity, we have been able to propose an user-centered definition of what it means for a person to be engaged in a situation of multi-activity: an orientation towards systematically treating projected pauses in one stream of activity as an opportunity to re-direct one's gaze and attention towards another stream of activity and vice and versa. In that respect, mobile communication in a transport situation is definitely experienced as a situation of multi-activity. As an example, the appearance of the progress bar on screen cues a pause in the smartphone-based activity and is taken as an opportunity to gaze away from the phone towards the mobility-relevant environment.

Events triggering a gaze switch in this way can be described as being sequentially implicative: they are treated as possible slots for reshaping one's attention and involvements in a sequential way. However, their occurrence (or non-occurrence) is conditioned by what happens in one stream of activity and not necessarily adjusted to the timing and demands of the other relevant activities. Temporal mismatches occur all the time. We have discussed one example in depth: a driver scanning down her list of incoming Facebook posts (which did not afford recognizable transition points) recognizably 'lagged' when the light turned green. The management of such temporal mismatches is a central feature in the competent handling of multi-activity situations.

The way in which activity environments are navigated projects possible transition-relevant points and therefore plays an important part in the management of multi-activity situations. We may introduce the concept of texture(s) to try and account for the propensity of interfaces to generate or project response-eliciting occurrences in the course of their use. The 'pragmatic texture' of an interface describes the way the design of the interface will "afford" interface-mediated events and responses as it is navigated. The 'sequential texture' accounts for the propensity of the interface to generate events with sequential implicativeness. An interface can be described as 'rugged' (vs. smooth) when it frequently (vs. rarely) generates events of a given type. Textures are relational in the sense that, like affordances, they are as much a feature of the technology design as something relative to a user or a community of users. For instance, in multi-activity situations, users display a heightened awareness of the sequential 'ruggedness' of their environments. Designing specifically for multi-activity environments

where safety concerns are critical might therefore involve increasing the 'ruggedness' of mobile interfaces to augment the frequency of possible transition points and minimize temporal mismatches in the demands of the varied activities the user is engaged in, even if such a design rationale might run against more conventional design strategies centered on user-friendliness.

Being 'absorbed' in the use of mobile technology, and therefore unable to cope with the demands of mobility in public places, has usually been defined a posteriori and retrospectively through some observable disturbance accounted for (and often criticized) retrospectively in these terms, such as in the case of the texting lady who falls in a pool in the mall. Recent studies discuss "hyper attention" to account for the ability of users to manage this multi-tasking generated by contemporary media (Hayles, 2007). We extend the way how these studies suggest to design devices for this new economy of attention (Rheingold, 2012 ; Gordon & Bogen, 2009). This goal can be achieved, by using our method, as video recordings allows to observe in depth and analyze pragmatically the management of multiple attention foci and streams of activity as a situated process. Being absorbed or conversely surfing the demands of multiple activities appears to be related to the way we recognize or ignore the potential sequential implicativeness of contingent events, act or not upon it, and manage the unremittingly occurring temporal mismatches in the emergence of such events in varied streams of activity. Showing how we do that in practice is a first step towards understanding how we may be held accountable. It is equally a step towards identifying diverse collective orientations towards the management of multiple activities, i.e. recognizing local and emergent cultures of availability and multi-activity.

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