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The design of social hyper-connectivity: Video-ethnography of the uses of Mobile Social Network Sites

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Abstract:

This article focuses on digital sociability developed using smartphones and *Mobile Social Network Services (mSNS)* in daily commuting. A video ethnography was made involving 35 French intensive users of the Facebook app. This method is based on the combination of context-oriented recordings made with user-worn camera glasses with mobile screen capture data. These data reveal how smartphone usage patterns tend to be organized according to mSNS notification devices and how these mediatized forms of social stress lead users to develop “hyper-connected” digital sociability.

By examining the distribution of users’ attention between urban settings and screen-based activities, this video-ethnography highlights how these notifications affect the organization of visual forms of social coordination in urban settings. We analyze how social forms of visual coordination are not only structured by internalized social norms but also according to rhythms of smartphone apps, how they display relational stress and perform hyper-connected relational practices.

Keywords: Smartphones; Social Network Services; Notification devices; Digital sociability; Urban Mobilities.

Introduction

In France¹ or the United States², users under 50 years old tend to prefer using Social Network Services with their smartphone instead of their computer. These new screens are at the center of the configuration of contemporary network societies (Wellman and Rainie, 2012) and are fundamental in the way people experience new forms of online sociability. This social phenomenon invites us to analyze the structuration of this mediated sociability in order to identify the singularity of their nomadic forms.

Research on the uses of social network services in mobile contexts distinguishes two types of « *Mobile Social Network Services* » (mSNS) (Boyd and Ellison, 2008). The first type includes the applications developed by major social media companies (Facebook, LinkedIn, etc.), microblogging sites (Twitter, Tumblr, etc.) and online dating services (Meetic, OkCupid, etc.). These applications are mobile versions of services originally designed to be used with a Web browser. In addition to these applications, “native mSNS” were specifically designed to manage digital sociability using the technological resources of smartphones. For example, these applications make use of the camera and GPS to share location-based snapshots (Instagram, Snapchat, etc.) or meet potential partners (Tinder, Grindr, etc.). These mobile applications are not really usable from a computer, unlike the first ones that were designed as an extension of previous fixed position usages.

Even though those two different types of mSNS led to a significant number of studies in computer science and HCI (Human-Computer Interaction), they were treated unequally by social sciences (Wang and Ma, 2014). For instance, these studies focused on how native mSNS could

¹ Cf. Bigot, Croute, 2014, <http://www.credoc.fr/pdf/Rapp/R317.pdf>

² Cf. Social Networking Fact Sheet, <http://www.pewinternet.org/fact-sheets/social-networking-fact-sheet/>

use geolocation technology to promote social encounters (Griswold et al., 2004; Humpfrey, 2007). Although there have been several studies on native mSNS, only a few of them analyzed the singularity of smartphone uses of SNS. When they did, they argued that mSNS enhance psychological addiction to mobile phones (Oulasvirta et al, 2012; Salehan and Negahban, 2013).

Most classical sociological approaches do not analyze the nomadic use of mSNS because they do not seem to have a real impact on relational and social structures. Indeed, sociological research concurs with the idea that relational structures are relatively stable despite the development of ICT and social media (Wellman and Rainie, 2012). These works are based on the observation that individuals use social media by importing ties they have been slowly developing offline since childhood and throughout their lives. These ties are often considered as an extension of social capital inherited from their family. In this perspective of the evolution in relational structures, it may not necessarily seem relevant to focus on the singularity of digital sociability developed in situations of mobility using mSNS.

This contribution, however, aims to show that this is relevant. These applications increase the amount of relational stress, displayed on smartphone screens by notification devices, and promote digital sociability, the characteristic of which is to be hyper-connected and distributed. The design of social stress with contemporary mSNS is crucial to take into account how these technologies have significant effects on the structuration of mediatized communications and interpersonal relationships.

1. Toward ubiquitous, hyper-connected and distributed digital sociability

SNS apps extend mobile phone communicational resources by encouraging users to develop “tele-cocooning” practices (Habuchi, 2005). In a context in which mediatization of

relationships increases, people favor the most efficient services to communicate with their recipient. This efficiency issue was observed from the first generation of mobile phones that contributed to amplifying a “connected mode” in the organization of relational structure (Licoppe, 2004), i.e the ego interacts more with others than it did when social encounters were based on face-to-face interactions. In this mode, composed of short and frequent contacts, what is being said is less important than the fact of keeping in touch. Tele-cocooning refers to this trend and its effects on relational structures. For instance, teenagers who send hundreds of text messages - favoring telecommunications with a small circle of peers - tend to strengthen their links to a circle of close friends instead of trying to extend their personal network to new relationships (Ishii, 2006; Ling, 2008).

Other studies suggested a more symmetrical conception of this “connected mode” giving more importance to ICT in the configuration of relational practices. The term “hyper” has been used to describe the amplification of this mode due to the growing use of email and the way ubiquitous workplaces tend to foster hyper-connectivity (Quan-Haase and Wellman, 2006). This concept is interesting because it refers to the way personal networks are redefined by technological environments in general and mobile phones in particular (Wellman and Rainie, 2012).

We can therefore argue that the use of social network sites promotes these hyper-connected exchanges, especially since it is possible to perform nomadic participations. Research has shown that intensive use of social media favors the development of social capital (Ellison, Steinfield and Lampe, 2007), optimizes the activation of relationships when searching for information or resources (Quinn and Oldmeadow, 2013) and reinforces personal fulfillment and civic engagement (Valenzuela, Park and Kee, 2009). Early works on mSNS uses follow this

utilitarian perspective by analyzing how users mobilize their smartphones to extend their uses of SNS in order to obtain such benefits. This research follows this direction defending the hypothesis that SNS mobile platforms amplify the phenomenon of personal networks being strongly structured around hyper-connected forms of telecommunications.

Implementing sociological research that takes into account the effects of ICTs in a social structure reconfiguration is not a simple task. To fulfill that goal we decided to adopt a user-centered approach, considering that their strategies and tactics deserve to be placed at the core of the study of smartphone appropriation. Even if we emphasize the fundamental part played by the user, this appropriation process is still profoundly structured by technologies themselves, their design and “pre-scriptions” (Akrich, 1992) inscribed in interfaces by designers. It is important to study the distributed dimension of mSNS uses. The agentivity involved in the organization of nomadic digital sociability is plural. It is distributed between users’ strategies to maintain their relationships and the way mSNS design organizes this sociability, promoting an increasing amount of relational stress. This research therefore aims to highlight the role of mSNS interfaces in the organization of uses and digital sociability.

This assumption of the distributed nature of digital sociability will lead to a more general sociological hypothesis. Hyper-connected and networked individualism has become a dominant social form (Wellman and Rainie, 2012) and individuals activate social connectedness (Bayer, Campbell, Ling, in press) in a way that tends to be reinforced by the growing number of relational demands displayed by mSNS. We will defend this hypothesis on the basis of a video-ethnography because this method allows us to describe how the multiplication of relational stress organizes nomadic digital sociability.

2. Video-ethnography of nomadic uses of smartphones

While many sociological investigations studied social network site uses, they have rarely analyzed the singularity of their mobile usage. This perspective becomes relevant since we aim to examine the way mobile interface design renews digital sociability configuration.

To achieve this goal, all mSNS used by participants in this research will be considered. We also have to understand how mSNS complement uses of other mobile phone functions (phone calls, SMS, etc.). We will do so by positioning their uses within a more general smartphone usage pattern analysis. That has been done through interviews during which participants explained their uses, the way they manage online sociability and how smartphones renew their practices. We interviewed 35 intensive Facebook app users aged 18 to 40 years old. Even though this declarative approach is valuable to gather users' reflexivity, it does not give access to usage patterns themselves nor help understand the way mSNS design concretely organizes digital sociability. A methodological protocol offering fine granularity analysis has been developed to analyze this role of mSNS design in smartphone usage patterns.

These patterns were identified by analyzing data collected using sensors installed on participants' phones. That led to the identification of patterns in the temporal organization of usage. Indeed, utilization of various functions (phone calls, SMS, Internet, etc.) is positioned sequentially during specific phases: for example, users start the sequence with the Internet connection and extend it by sending an SMS, etc. (Do and Gatica-Perez, 2010). This sequential organization of usage patterns is effective in that 68% of uses are developed from a single application and the average length of 50% of utilizations does not exceed 5 seconds (Böhmer et al., 2011). Despite these regularities, it is difficult to identify a dominant usage pattern because

there are too many applications available and their uses vary from one country to another (Falaki et al., 2010). To identify regularities, it is relevant to try to identify most popular applications, such as local news, music and video game apps (Xu et al., 2011). These preferences can also be correlated with socio-demographic variables (Bian and Leung, 2015) and contexts of use, in order to show that mSNS are most frequently used during the “static” phase of mobility and their utilization decreases as the session goes mobile (Trestian et al., 2009, p.6).

If these investigations address usage patterns in a general perspective, it is interesting to complement their findings by collecting fine-grained data in order to understand spatio-temporal organization of uses and the way mSNS uses are performed according to urban settings. This research achieved this goal by describing practices using video recordings. This video-ethnography was made asking users to record their uses during a week, especially during their daily commuting. To collect contextual data on the move, we asked participants to wear camera glasses (Mark, Christensen and Shafae 2001; Zouinar et al., 2004). While such a portable set-up may provide rich detailed data about the ‘natural’ uses of smartphones on the move, it does not allow catching all the information displayed on the screens. To analyze smartphone usage patterns, it was useful to synchronize these contextual recordings made with camera glasses with the video recordings of screen activities (Brown et al., 2013; Licoppe, Figeac, 2015). The video-ethnographic data presented here is based on the combination of context-oriented recordings made with user-worn camera glasses and mobile screen captures produced using a screen recorder installed on smartphones (Image 1).



Image 1. Synchronisation of camera glasses video recordings with screen recorder recordings

This method was used with 20 users of our sample ($n = 35$), 10 women and 10 men between 18 and 35 years old, living in Paris or Toulouse, who frequently use mobile social networking applications in situations of mobility, Facebook in particular. This video-ethnography allowed us to collect 110 video recordings, representing 42 hours of smartphone usage in public settings. After retrieving the recordings, we conducted interviews during which users were asked to comment on significant sequences, sharing their interpretations about their smartphone uses and especially mSNS apps.

3. Design of social stress in smartphone usage patterns

This video-ethnography aimed at collecting an audiovisual corpus to visualize and analyze the organization of smartphone uses during urban mobility, especially during daily commuting in Paris and Toulouse. These video recordings are used to describe the spatiotemporal configuration of usage patterns in order to identify the circumstances in which mSNS are used most. Fine-grained data from this study will thus complete works based on large-scale analyses of smartphone usage using sensors. It seems relevant to start by comparing that quantitative data with the qualitative data produced here on the basis of a smaller corpus.

To make that comparison, audiovisual sequences were represented in histogram bars representing the duration of each application usage. Figure 1 below shows for example the 8 sequences Emilie recorded. This 30-year-old woman lives in the suburbs of Toulouse and works in a notarial office located downtown. She has a forty-minute bus ride to get to her workplace so uses various smartphone applications for entertainment during her commuting. As she uses outdoor public transportation, mobile networks are perfectly available unlike in underground transportation where users must configure smartphone usage patterns to bypass connectivity issues (Figeac, 2012). This example is interesting because Emilie can freely organize her uses and follow her media whims as she wants.

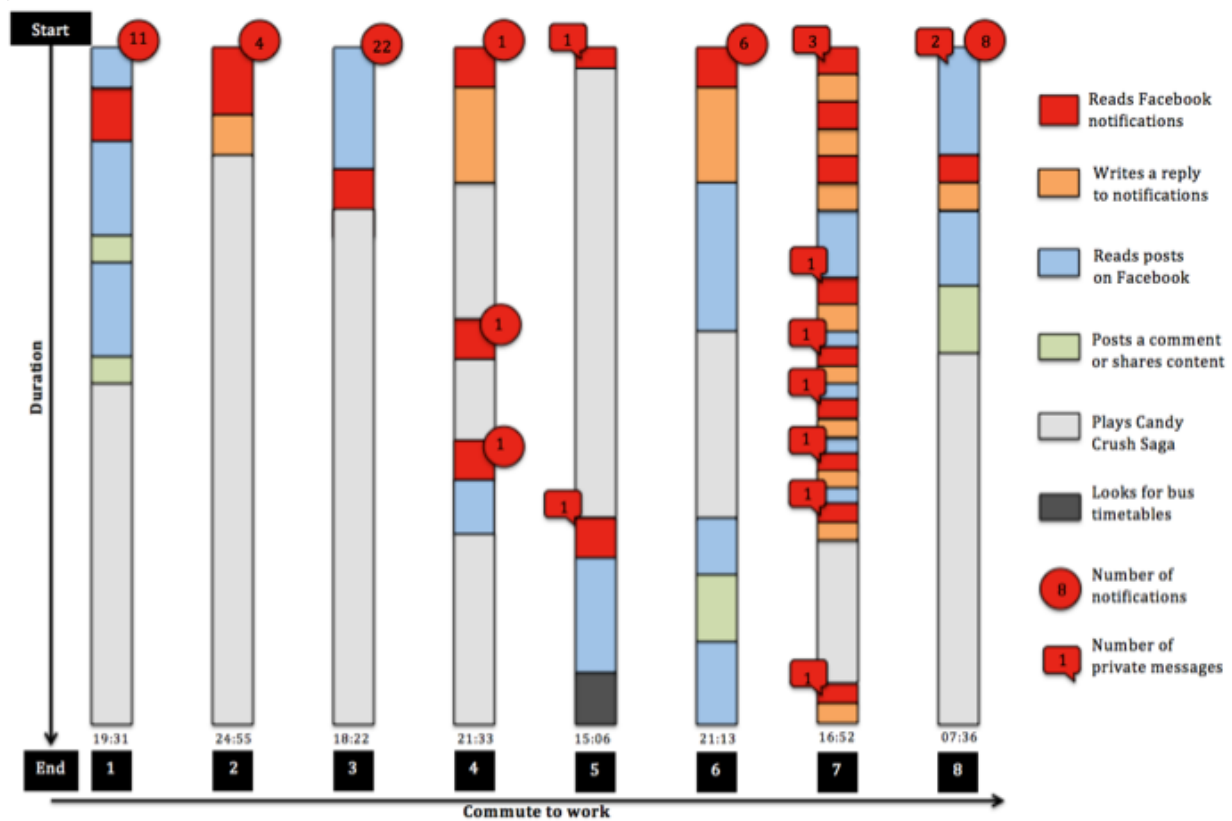


Figure 1. Portion of each app in smartphone usage sessions

First, it is interesting to point out that the average duration of her usage in this context is 18.14 minutes. If we compare this result with Böhmer *et al.* (2011), it appears to be longer than the average duration of smartphone usage, which does not exceed five seconds in 50% of the sessions. Compared to the overall duration of smartphone use during a day (59.23 minutes; *ibid.*, p.4), this corpus refers to the small amount of extended sessions (6.6%, *ibid.*, p.5) during which at least three applications are opened. This is a characteristic of this video-ethnographic data since participants have been asked to activate video recordings before engaging in this specific type of session. Therefore, this research will specifically document the longest chains of app usage.

However, it is relevant to hypothesize that these longer chains only prolong the usual opening of usage patterns observed more generally during shorter chains. It actually appears that most participants reproduce the same usage pattern during the first phase of their sessions, whether they are brief or prolonged. Our results prolong studies showing how users generally start by one of the smartphone's communicational functionalities (49.60%, *ibid.*, p.6). This trend is amplified here as Figure 1 shows because Emilie starts all her sessions opening the Facebook app (sequences 1, 3 and 8) and by reading notifications displayed by this app (sequences 2, 4, 5, 6, 7).

These notifications are usually treated at the beginning of sessions as users start by checking them in 53.4% of the sequences. They are mainly notifications displayed by the Facebook app (in 87.1% of the sessions) and Snapchat (10.2%). The notifications of other SNS applications (Instagram, LinkedIn, etc.) or microblogging apps (Twitter and Tumblr) are secondary in this corpus (2.7%) as French users do not seem to treat them as high-priority.

The way users perceive notifications and the role they play in the organization of relational practices clearly appear during interviews, as seen when talking to Sarah, a 29-year-old executive assistant:

Researcher: "When you use the Facebook app, what section do you visit?"

Sarah: So... notifications and after that posts. After that I quickly read news published by my friends or the group pages I subscribed to. Sometimes, if I'm interested I can comment on my friends posts but it's often brief, I do not know, less than a minute."

It is interesting to note that she starts using the Facebook app by treating notifications and explains immediately how this connection is usually very brief. Mark, a 24-year-old student, does the same by checking Facebook notifications all the time and multiplying very short sessions in various contexts to follow new posts published by his friends:

"When I go on Facebook (using his smartphone), it's very short. I check, I leave. I check, I write something, I leave. So in an hour, I can go 4-5 times but it's never longer than 3 minutes."

Users appropriate notification services to continuously monitor relational events published on social network sites. This behavior is characteristic of contemporary forms of hyper-connectivity in that it refers to an intensification of first configurations of "connected presence" (Licoppe, 2004) characteristic of basic calling features of older mobile phones (phone calls, SMS). To understand this phenomenon, let's take the example of Caroline. This 21-year-old student takes the tramway several times a week to go to university. She describes a video recording during the interview and explains how she starts using her smartphone by opening the Facebook app among the variety of applications available. She says she chose Facebook because

notifications displayed three “events” on the app logo and the reception of a message in the Android top bar on the upper part of the screen (see Image 2). She points out:

“I went on Facebook because there were these two things there: there were notifications on the “F” of Facebook and, here, I got a message. I wanted to see what it was.”

The app begins by displaying comments of a past post (see Image 3). Various notifications are displayed at the top of this screen: there are "3" events on the "News Feed", "3" incoming "Messages" and "3" recent "Notifications" (this section is translated into “Events” in the French app). Among these types of notifications, the user prioritizes the "Message" section and selects a specific one (see Image 4).

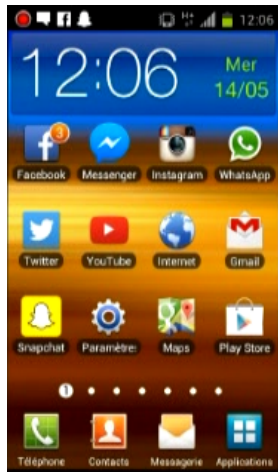


Image 2. Checking notifications



Image 3. Treating social stress

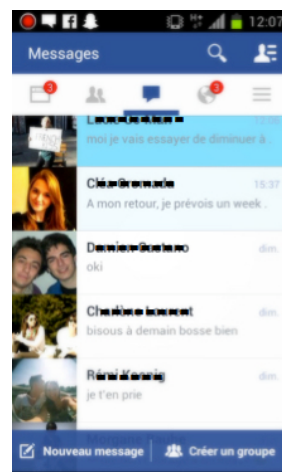


Image 4. Prioritizing a specific relation

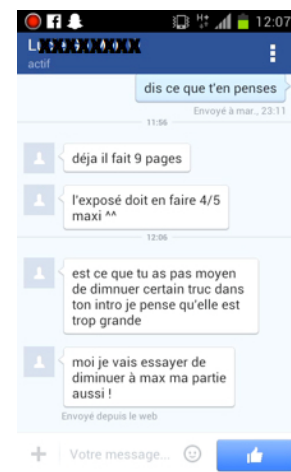


Image 5. Reading a private message

This message had just been posted by her friend who had sent her a request (see Image 5). They are working on a presentation together and Caroline is on her way to the library where she is going to meet this friend. Her friend asks: *“Can you find a way to shorten your intro a bit,*

I think it is too long". Caroline answers: "*Are you sure about the 4 to 5 pages? It isn't much but, yes, I'll have a look*". She responds quickly to her friend even if they will meet in a few minutes. Her answer reveals her availability and commitment to their common activity. Therefore, the description of this sequence highlights the way Caroline starts using her smartphone by reading private messages. In other words, she favors notification services that display the most important social stress and project a short-term response.

This video-ethnography more generally describes the way smartphone usage tends to be organized according to notifications. This usage pattern is composed of three sequentially ordered steps: 1. users prioritize applications that display notifications; 2. they especially favor those mediatizing social stress; 3. then they choose certain notifications over others according to social status and type of relationship (close friend, weak tie) and their representation regarding a legitimate response time (e.g. short-term response projected by an imminent meeting).

The structure of this pattern does not only refer to the role of notifications, it is also linked to the normative organization of mediatized interactions. For instance, the app chain shown in sequence 7 (see figure 1 above) where Emilie starts by answering the three private messages received the night before. She instantly answers these messages because they were displayed and because they include a question. She first answers her friend Balla's request "can you send me the link?". Then she responds to Nadia's request: "how much please?". Then she writes another message in order to close this interactional sequence:

Participant: "Are you entitled to unemployment benefits?"

Her friend: I don't know. I called this morning; a very nice gentleman pre-registered me and gave me an appointment in early October to see if I have rights.

Participant: That's great. And you might also get some new benefit rights with your home vending activity."

In other words, Emilie reacts here to social stress she had sparked in the past by asking her friend a question. This simple example illustrates how hyper-connectivity patterns are correlated with the normative structure of mediatized interactions, while considering that each interactant alternately sends and receives social stress. This is important because studies on notification services that try to mitigate their disruptive effects tend to show that they seem to disrupt the ordinary course of activities (Ho and Intille, 2005). By analyzing the organization of professional activities, these studies consider as disruptive any event that disturbs employees' activities. But this cognitive interpretation of the effects of notifications doesn't allow us to understand how users mobilize them to optimize their connected-presence in order to enjoy social and psychological benefits related to their intensive participation in SNS (Ellison, Steinfield, Lamp, 2007; Quinn & Oldmeadow, 2013).

This video-ethnography highlights the relational dimension of notification uses by showing how the design of mSNS renews mediatized interactions by promoting social hyper-connectivity. The next part will describe how the pervasiveness of notification services also renews visual forms of social coordination (Sudnow, 1972; Sacks, 1992) through which smartphone users coordinate with other public transportation passengers.

4. How usage patterns are formed according to public settings

Our analysis first highlighted the way smartphone usage patterns are organized according to notification services. It prolongs previous investigations showing how planned or passive alerts change use sequences (Bentley and Tollmar, 2013) and encourage users to open apps,

especially those that mediate social stress (Pielot, Church and Oliveira, 2014). Even if users don't like notifications (Oulasvirta et al., 2012) and often deactivate them in some apps (video games, news, etc.), they use those published by mSNS to optimize their social reactivity and their connected presence. This user-centered study describes how they mobilize these services to adjust their smartphone usage to contextual settings (Licoppe, 2010), especially during daily commuting.

4.1 The consultation step in mSNS usage

Different use contexts such as home or workplace, urban mobility or waiting time, actually influence notification services and smartphone uses. These various contexts make it impossible to identify a unique usage pattern (Falaki et al., 2010). However, our video recording protocol allows us to understand uses in urban environments, as Alexandra, a 23-year-old student explains:

Researcher: "In which situations do you use the Facebook app?"

Alexandra: In which situations... in the subway most of the time or in the street when I have nothing to do. When I walk it is less easy but, yes, when I'm in a waiting room, when I'm waiting for something, when I don't know what to do, when I'm just waiting without anything special to do on the Internet and I don't necessarily want to send messages or don't have anything to say to my friends, I like to go on Facebook, have a look at my account, it allows me to make use of the time. I like to check the latest publications."

The Facebook app obviously allows this user to make the most of waiting times and times when she does not know what to do, as is often the case when she is in the subway. If boredom seems to be the main reason why she checks her smartphone, this does not explain how

she concretely appropriates and uses it. She chooses to consult Facebook when she does not know what else to do on the Internet or does not want to send messages. As she says, she would do differently if she wanted to communicate via SMS or browse the Internet. Her usage is defined according to this temporary desire. This finding shows how it is problematic to identify a dominant usage pattern when the user's motivation is to stop boredom by discovering new apps or experimenting new uses. A straight analysis of these forms of routinization would miss that desire to discover and those opportunistic forms of cultural attachment. Most large-scale analyses of smartphone uses, however, make these mistakes and forget that first motivation. Thus, we will focus on identifying regularities in usage patterns while recognizing their randomness.

The example of Emilie is interesting to highlight this issue. She usually prioritizes notifications when she uses the Facebook app (see sequences 2, 3, 5, 6, 7). She sometimes extends her utilization by reading news feed (6, 7) or closes the Facebook app to open another one (2, 4, 5). She can also start by reading news posts before checking notifications (see sequences 1, 3, 8), especially because the app opens directly into the news feed she has a quick look at before reading notification contents.

Even though fluctuations appear within Facebook usage patterns, it is still possible to identify regularities, especially the fact that users tend to treat notifications that mediatize social pressure before consulting news feed, as seen with Jennifer's practices:

"I do not often use all Facebook functionalities, but I check it, yes. I check the news feed almost every day. But say something, do something on Facebook or publish my comments or something like that... I prefer to read other people's posts than posting things myself. I like to

read people's profiles, look at their photos, well, that is something I enjoy, especially with people I like.”

This tendency to appropriate Facebook on a consultation mode is particularly linked to the use constraints in mobile apps, especially among older users as seen here with Betembi, a 36-year-old nurse:

“Well, it's true that on my phone my uses (of Facebook) are very, well, very brief, I don't know how to say it, browsing is not very smooth and it gives me less freedom than on the computer. With the computer, I really have a global vision, so it's faster, I can easily read one thing or the other whereas on my phone I just read the latest comments, profile updates, possibly profile pictures that have been changed.”

This is a recurrent trend of users. They appropriate their smartphone to check the latest news of SNS and prefer to participate when they are at home, using their computer. They participate via mSNS when they have a request or during particular events, such as birthdays. That is also particularly true among older users, as Francis, a 40-year-old associate professor puts it:

“(On the Facebook app) I just have a look at what has happened, what people have posted and I react in the evening. There really needs to be a special event for me to respond quickly.”

This example leads us to make a distinction between answers to requests sent to the users by others, via private messages or comments, and participation initiated by users when they post something or share content. This distinction allows us to represent the time dedicated to consultation and the percentage of participation in mSNS as shown in figure 1 above. The

example of Emilie shows she published 4 comments over a week: she wished happy birthday to a friend, then she published three comments related to pictures, a friend's selfie, a friend's trip and a consumer product. Even though publishing that kind of content is part of her usage, it still is much less frequent than the time spent reading news or writing a reply. This is why users report being less active when they use SNS with smartphones.

However, they put this trend into perspective in emphasizing their appropriation of one-click participation options, such as the "Like" or "Share" buttons:

"I really enjoy reading posts but I prefer commenting by saying "I like" (i.e. by clicking on the like button), I like this thing. Finally we implicitly take part without necessarily saying something or writing a sentence, I find it easy, natural."

The use of such functions is suitable with smartphones and the way they can be mobilized to maintain hyper-connected presence. Their uses correspond perfectly to the main smartphone usage patterns we have just described. This video-ethnography will now be detailed by showing how urban mobility and public settings frame mSNS uses.

4.2 Hybridization between smartphone usage patterns and visual forms of social coordination

Smartphone usage patterns are organized according to contextual issues such as urban mobility settings. For example, in public transportation French users develop opportunistic media attachments to Mobile TV and other Internet services because they are not continuously usable due to the temporary unavailability of mobile phone networks during certain phases of daily commuting (Figeac, 2012). Beyond these technical constraints, it is necessary to consider

more generally how chains of use organization can vary from one day to another depending on promiscuity issues in public transportation, as this 22-year-old student explained:

Researcher: “Your trip (to go to university) is about 1 hour long?”

Mickaël: Yes. I only use subways so I’ve got connections to make. The fact is when one is standing, well it depends if you can sit or not, but when one is standing, when it’s packed, it is more difficult to use the telephone. However, if I can sit down, I use it and it (the mobile phone network) generally works fine.”

Smartphone uses are therefore closely articulated with micro-mobility: the journey between two subway lines, movements due to the passengers' movements, the possibility or not to sit down, etc. From this point of view, the video-ethnographic protocol allows us to complement studies analyzing mobile phone uses in situations of mobility (Brown, McGregor and Laurier, 2013), especially in public transportation (Murtagh, 2001). It reveals more precisely how users organize their visual commitments, their gaze switches between their smartphone screen and urban environments in public spaces, when they are in situations of mobility (Licoppe, Figeac, 2015). It is therefore interesting to describe how this specific form of multi-activity, the joint commitment in mobility and in screen-based activities, is organized according to technological device rhythms.

For instance, Clement, a 27-year-old student, uses the Facebook app when he takes the tramway to go back home. He starts by browsing through the news feed for two minutes. When he reaches the posts he has already seen in the morning, published “6 hours ago” (see Image 6), he quickly scrolls the screen up then, once at the top, he operates a top-down index motion (see Image 7). After this action, a progress circle is displayed on the screen (see Image 8) to indicate

the application is loading possible new content. We can note how he seizes this loading time as an opportunity to stop watching the screen to look up around him and to scan the urban environment from right to left (see Image 8).

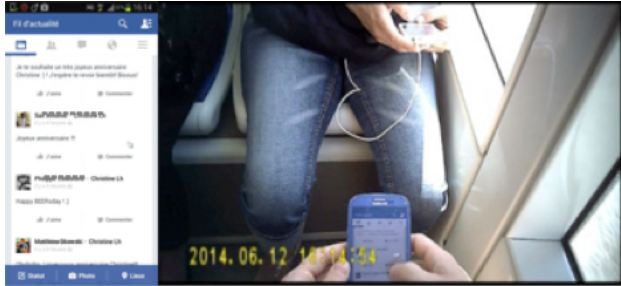


Image 6. Reading the news feed



Image 7. Updating news feed



Image 8. Gaze switches during a Facebook app loading time

Due to its important recurrence in our corpus, this simple gaze switch allows to highlight the way users manage urban settings during loading times and inactive phases of smartphone apps. It is not possible to tell what users are effectively looking at when they look up around them. They can undertake these gaze switches in response to a large variety of causes (passengers' movements, a stop at a station, the presence of a pretty woman, disturbance due to a homeless person, etc). But the transition phases in smartphone usage patterns, such as loading times, are essential in understanding this complex cognitive economy of gaze switches. This example helps to demonstrate how visual forms of social coordination (Sudnow 1972; Sack, 1992) are reorganized nowadays according to rhythms of mobile ICT. It renews the analysis of

the “civil inattention” phenomenon described by Goffman (1963, p. 83) to account for this minimal unit of public life consisting in glances exchanged between strangers. This visual form of coordination cannot be reduced to a simple set of visual exchanges between two interactants who use and negotiate these visual courtesies as simple internalized social norms. This visual grammar of social interactions is now adjusted with smartphone screen issues and how they lead us to operate gaze switches in public settings. This visual grammar refers to a “hybrid ecology” (Crabtree and Rodden, 2008) in which social interactions between co-present persons are increasingly framed according to the settings of ICT environments.

This video-ethnography allows us to better understand this process of hybridization between physical and digital environments because another usage pattern emerges from video recordings. Users maintain their visual commitments towards screen-based activities at the beginning of uses. Then, over time, they look around them and visually manage the urban environment more often. Figure 2 below illustrates this phenomenon.

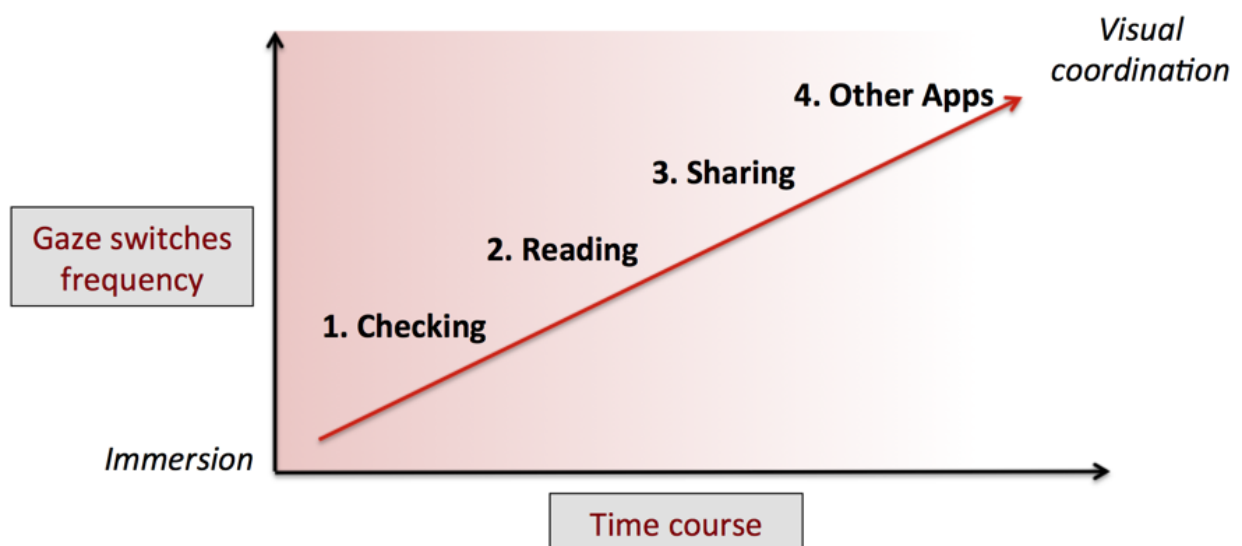


Figure 2. The frequency of gaze switches increases over time

As shown in the first section, users prioritize notifications when they activate their smartphone to respond quickly to incoming messages or comments. First, when they write answers, they tend to stay focused on this absorbing activity on a cognitive level. Then, they stop for a while to look around. Once they have responded to the social pressure of this relational stress, they tend to use mSNS by adopting a “reading mode” described in the previous section. They pay less attention to screen-based activity; this is even more obvious progressively over time, as usage goes on. Their attention is highly focused when they start to read news feed and decreases as they reach older or previously read posts. This gradual loss of interest related to mSNS is coupled with the increased frequency of gaze switches towards the surrounding context.

This phenomenon also appears during the longest app chains, when users switch to other applications such as video games. For example, it is possible to observe, when users play Candy Crush, how their gaze switches are mostly positioned during the transition phases of the game, during loading times between levels or when candy groups explode.

In other words, when users appropriate their smartphone in a hyper-connected mode, as during the opening of an mSNS, they tend to disengage from physical contexts to focus on technological demands. Social stress mediatized by these media comes first at that time and leads users to defer gaze switches and their participation in visual forms of coordination. This trend shows how relational norms at stake in the regulation of mSNS uses can impact the economy of visual forms of coordination regulating social interactions between strangers.

Conclusion

This video-ethnography completed studies related to the role of notification devices in smartphone usage patterns by showing how users prioritize them at the beginning of chains of

uses. The detailed analysis of the temporal organization of the first steps of usage patterns shows how they tend to be structured according to three sequentially ordered phases: 1. Users often start by applications that have displayed notifications; 2. They favor those that have displayed social stress; 3. Among these relational solicitations, they prioritize those depending on social status or types of relationships (close friend, weak tie) and their circumstantial representation of response time (for example, a brief time period due to an imminent meeting). This sequential organization of the first steps of usage patterns tends to frame the management of mediatized interactions in a way characteristic of “hyper-connected” forms of contemporary individualism (Rainie, Wellman, 2012).

This social trend refers to a socio-technical phenomenon. The design of smartphones encourages users to be reactive and respond quickly to social stress mediatized by notification devices. As mSNS apps amplify this technological push, they tend to promote these hyper-connected and ubiquitous forms of participation in social network services. The propagation of this social phenomenon is linked to users’ strategies because they configure these relational notifications to maximize their reactivity in some contexts, especially in disruptive situations such as daily commuting.

This video-ethnography shows more precisely how these hyper-connected uses of mSNS renew visual forms of social coordination in public settings. When they start using mSNS by answering notifications, users tend to stay focused on this absorbing screen-based activity. During this hyperconnected phase of smartphone usage patterns, they manage their mobility in public space by looking around them during breaks and loading times that occur during mSNS uses. Over time, when they read news feeds, their gaze switches are more frequent. This phenomenon reveals how visual forms of social coordination are not only organized according to

internalized social norms. They are performed according to rhythms of apps and ways in which mediatized forms of social stress tend to be display on smartphone' screens.

Finally, this video ethnography shows how mSNS design and their notification devices promote hyper-connected practices in that their configurations converge with users' social dispositions. The boring and routine nature of urban mobility leads them to search new sources of entertainment, especially by experiencing new digital sociability. By allowing them to multiply and diversify their mediatized exchanges with close friends, mSNS apps push them to dissociate situations experienced. This progressive substitution of screen-based activities to anonymous forms of copresence could promote a public space practiced on a "being alone together" mode (Turkle, 2011).

The progressive polarization of social structures around a dominant form of hyper-connected and networked individualism (Wellman and Rainie, 2012) could generate these effects on a proximal level. When they are in public spaces, a growing number of people now prefer giving their full attention to their smartphone screen. However, it is too radical to consider that this contemporary form of "media immersion" is now the dominant form of visual coordination in public settings. This video-ethnography shows how "being alone together" is rather a temporary and dynamic form of immersion in media uses, characteristic of a specific phase of usage patterns, the hyper-connected phase. After that, once they have treated social stress mediatized by their smartphone, users pay more attention to surrounding environments.

It is also problematic to interpret this media immersion as an anti-social behavior. When they are focused on their screens, users can dedicate their full attention to their mediatized relationships. To better understand the issues of this social phenomenon, it would be relevant to

highlight how these relational technologies contribute to increasing, alongside social variables, the centrality of hyper-connected relations in the structure of personal networks. It will also be necessary to analyze whether these ubiquitous forms of hyper-connected exchanges with close friends leads users to avoid anonymous co-presence and experience them as moments of stress and displeasure.

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