

Cross-media communication in context A multi-method approach

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Abstract

In this article, we suggest and discuss a qualitative, multiple-methods approach to data collected on smartphones as a way of uncovering a user-centred perspective on cross-media communication. As an individualised multimedia device, the smartphone represents a relevant starting point for studying individual users' cross-media practices. Moreover, the technological affordances of the smartphone, including built-in sensors and GPS tracker as well as features for capturing photo, audio and video material, enable the collection of a wide range of data. These properties have mainly been approached from a quantitative point of view focusing on automatically logged use data as an alternative to, for instance, survey data. Complementing this evidence, we argue that a qualitative, multiple-method approach to data collected on smartphones provides crucial insight into the contexts and everyday practices of cross-media communication.

Introduction

It has become increasingly clear that the study of media use in contemporary society cannot be isolated to individual services or types of content. Information, communication and users travel across media and the analysis of specific instances of communication, such as second screen use, writing a status update on social media or making a phone call,

makes little sense if we do not see them in concert with other media use. Much academic writing so far has been focused on the expansion of specific media content across several platforms, such as convergence culture (Jenkins, 2006) or transmedia storytelling (Scolari, 2009). However, another key perspective concerns the way users themselves traverse and combine media to weave a web of communication as part of their everyday practices. In this article, we focus on this user perspective and discuss how it can be approached in a methodologically sound manner. While it may be empirically difficult and ethically questionable literally to follow individual users as they traverse media during the course of their daily lives, digital media platforms such as laptops and smartphones accumulate vast amounts of data on media use that can be used to explore combinations of media and to assess cross-media use.

We specifically discuss data collection through the smartphone as a way of studying cross-media use and the way it is embedded in everyday life. Smartphones have been celebrated as a versatile tool for collecting data about everyday life activities, thanks to the integration of the smartphone into these very activities. On one hand, we use the smartphone to document extraordinary and ordinary events of our lives – for example, with the phone's built-in camera and video functionalities. On the other hand, our activities are recorded in various types of data formats such as communication histories, GPS data and timestamps. These data tell an important, if indirect, story about the way we live, how we move about, who the most important people in our lives are, and so on. Hence, while smartphone data document the use of the smartphone, they may also – to some extent – be said to reflect the underlying structures, routines and practices of everyday life.

Metadata – data about data – allows us to trace the activities of users as they communicate and interact on the Internet. In this way, it represents a unique source of “found data” as opposed to data created through interviews or surveys (Jensen, 2013). This potential for the smartphone to collect data about everyday life through “unobtrusive measures” (Webb, Campbell, Schwartz, & Sechrest, 2000), such as automated behavioural logging, have led to a range of optimistic exclamations about its possible utility in research.

For instance, proponents of “computational social science” compare smartphone data as a measure of everyday life with brain scanner measurements of neurophysiological processes (Lazer et al., 2009). The emphasis in this perspective is clearly on the amount and alleged “neutrality” of data allowing us to draw a precise map of everyday life independently of people's own statements. At the same time, such claims have been countered by a number of critical voices from the social sciences and humanities in particular (Boyd & Crawford, 2012). So, there is now a growing literature discussing the methodological and epistemological underpinnings, opportunities and challenges of using behavioural log data in the analysis of digital media use (Lomborg, 2014; Ørmen & Thorhauge, 2015).

In this article, we continue this discussion by broadening the perspective on data collected on smartphones and by suggesting a qualitative multiple-method design that con-

textualises and qualifies such data as expressions of cross-media practices in everyday life. We do this, first of all, by situating data collected on smartphones in a classic methodological discussion of audience studies on the relationship between text and context in media use. Second, we present and discuss a multiple-methods approach to studying cross-media communication through the smartphone, drawing on examples from an empirical study of smartphone use in everyday life using GPS data, screen dumps from smartphones and qualitative interviews. Finally, we present and discuss some analytical perspectives that have emerged from this work with regard to the analysis of smartphone data as expressions of more general practices in everyday life. Specifically, we discuss the difficulties involved in mapping data directly onto practices, the importance of distinguishing between primary and secondary activities and the importance of understanding what is going on in the "data voids." A qualitative multiple-method approach including a wider range of data may resolve some of these issues by contextualising log data and introducing participants' own perspectives as a key data source.

Studying media use in everyday life

The study of media use in everyday contexts has evolved through the history of audience research. Questions about how ordinary people accommodate and make sense of media in daily life have constituted a main agenda of audience research – particularly, since the advent of cultural studies in the 1960s and 1970s. One key aspect of cultural studies was a reorientation toward culture as "the ordinary" (Williams, 1959), that is, as a form of life rather than a collection of fine arts. This brought about an "ethnographic turn" (Drotner, 1994) in media studies involving a movement away from analysing the content of media texts and toward mapping the diverse contexts of media use (e.g., Lull, 1980; Radway, 1984). The local meanings and practices of media users in the context of everyday life became the primary object of study. Domestication theory (Bakardjieva & Smith, 2001; Bakardjieva, 2005; Haddon, 2006; Silverstone, 1994, 2006) has continued this tradition with its general focus on the way technology is "domesticated" in the home and appropriated into different everyday contexts of use. Combining the ethnographic turn of media studies with the focus of science and technology studies on the basic malleability of technology, this stream of research introduced a range of studies focusing on the way communication technology is interpreted and adapted in accordance with the specific characteristics of the social context. Similarly, more recent studies into mobile communication emphasises the mundane activities of mobile phone users as key to understanding the impact of mobile technologies on society at large (Ling & Haddon, 2001; Ling, 2004, Lomborg, 2015).

Throughout this history, the concept of "everyday life" has taken on different meanings, depending on the empirical and analytical focus. Whereas, in the early media ethnographic studies, everyday life was approached as a set of specific contexts of consumption such as the everyday surroundings of housewives (Radway, 1984) or families (Lull, 1980), domesti-

cation theory has developed a range of analytical concepts for describing the structures that condition adaptation and use such as “the moral economy of the household” (Bakardjieva, 2006; Morley & Silverstone, 1990). By comparison, studies in mobile communication have foregrounded different user strategies or genres of use, such as micro-coordination (Ling, 2004) or the interlacing of activities (Baron, 2008). Accordingly, the concept of everyday life can be approached from a range of perspectives and may point toward specific contexts of use, the norms and economies that structure everyday life or specific strategies on behalf of the user.

The methodological approach to studying media in everyday life has evolved along similar lines. As was just stated, the advent of cultural studies brought about an “ethnographic turn” involving a growing focus on qualitative methodologies for studying media use in its empirical contexts. This methodological focus has traditionally been tied to very specific physical and social settings, as illustrated by the emphasis on the home. However, digital and, in particular, mobile media require a loosening of the presumed connection between everyday life and specific contexts – and, perhaps, a broader understanding of everyday life as such, including a better understanding of the individual’s navigation across a range of everyday contexts. At the same time, the key characteristics of digital communication technologies, including their mobility, sensors and affordances for collecting use data, have directed attention toward “big data” as a new means for studying media use. Much of this research has focused primarily on the quantitative aspects of logged use data and its superiority to self-reports when measuring media use (e.g., Boase & Ling, 2013). However, these data might just as well be put to use for qualitative approaches focusing on the way individuals use media as part of their everyday practices (Ørmen & Thorhauge, 2015).

In this article, we understand everyday life as comprising the range of more or less connected, organized and routinized activities that an individual carries out on a regular, if not daily, basis – from waking up in the morning, getting ready for work, and taking the kids to school to the pursuit of personal hobbies and interests such as doing sports or going out with friends. That is to say, everyday life is practiced through our actions and communications, which, in turn, are structured by the demands of our surroundings and our personal interests and commitments (Helles, 2011). These practices frame the way different media are put to use and are, for this reason, crucial if we are to understand cross-media communication from the point of view of the individual user. In the following sections, we will suggest a qualitative multi-method approach to data collected on the smartphone as one way of uncovering and analysing such practices.

Data collected on smartphones as traces of communication and of contexts

The smartphone may be said to constitute a meta-medium – that is, it combines, integrates, and reshuffles previously separate media and modes of expression on a single plat-

form of hardware and software (Jensen, 2013; Kay & Goldberg, 1977). In this section, we consider the smartphone as a methodological entry point for collecting empirical data on media use, including cross-media communication, in everyday life. We discuss the multiple types of data this may involve and reflect on status of the collected data against the classic distinction between text and context.

At a very basic level, the smartphone allows for automated as well as manual collection of data on media use in everyday life. Automated data collection runs in the background of users' activities on the smartphone and piggybacks on the built-in software features of the smartphone and the installed applications to create a log file with relevant data for the concrete research project. However, the smartphones also enable the manual collection of data as notes, photos or screen dumps. This typically requires some effort on behalf of the smartphone user, such as taking notes on their smartphone (media diaries), responding to the researcher's queries (e.g., Hargittai & Karr, 2010) or taking screen dumps of the smartphone screen at given times during the day. The appeal of automated data collection lies in its unobtrusiveness as well as the small effort it requires for data collection, apart from the technical skills needed to access, retrieve and manage the relevant log files. The appeal of manually logged data, on the other hand, lies in its anchorage in meaningful instances of communication or action as seen from the perspective of the user. On one hand, manual logs may represent alternative understandings of what counts as an instance of use as compared to that of the automated logging scheme; on the other hand, it may provide relevant perspectives on how to interpret log data as an expression of practices in everyday life.

From a cross-media perspective, smartphone log data has a general advantage: by using the platform of the smartphone as a basis for automatic or manual logging rather than a specific service such as an application, it is possible to create a log of all activities on the smartphone – that is, to create a log file that cuts across the media that are integrated on the smartphone.

Data collected on digital media may be said to blur the distinction between text and context (Lomborg, 2012). The log data collected on use through the smartphone may, at once, be seen as a trace of communication – that is to say, a text made up of all the acts of communicating and acting with and through the device – and a trace of the context of use, signposting through metadata the actual spaces of use, the temporal structures of everyday activities, and so on. Indeed, as will be demonstrated in the subsequent sections, the smartphone data provide significant indications of the integration of media use across other types of activity in the course of the day (work, transport, relaxation at home, etc.). That is to say, data collected through the smartphone can potentially help us gain a better sense of the contexts of media use – the physical locations, the place of specific media in the overall media ecology, and the relationship between smartphone use and the conduct of everyday life as such. At the same time, however, the log data provide no insights into the social settings, and the meanings of relationships enacted through the smartphone do not

reveal themselves through automated data logs. To account for these dimensions, other – qualitative – methods for data collection must be included. In the following, we present a multi-method design that seeks to combine smartphone log data with other data sources in order to get a richer understanding of the role and place of cross-media use during an ordinary day.

A multiple-methods approach for studying crossmedia communication with the smartphone

With respect to the analysis of automatically logged use data on smartphones, one basic question is whether the data actually represents social reality in the manner we expect. This question is partly technical and has to do with the way the logging system interprets the action that is being logged (which events trigger logging, what counts as an individual act and so on?) and whether data can be compared across platforms (do different operating system log according to the same principles?). Beyond such technicalities, questions of what log data represent arise regarding, for instance, whether a high frequency of communicative acts can be equated to a high level of communication or whether a low level of activity on the phone can be equated to a low level of activity in general? These questions are further complicated by the fact that the smartphone is not a neutral data collection tool but, rather, a social artefact that is continuously being negotiated and critically reflected upon by the users in the context of use (Lomborg, 2015; Thorhauge, 2016). Consequently, smartphones are integrated in social contexts in many different ways, and the same action on the phone may represent radically different social situations in practice. For this reason, the study presented below integrates a range of methods and types of data in order to broaden the analysis and include users' own accounts of the documented contexts of use.

The study combines automatically logged data, manually logged data and qualitative interviews to uncover and describe the everyday practices that frame cross-media communication from the point of view of the individual user. The study focuses on the way individual users, given the specific opportunities and constraints of their life situations, move through their day, how specific situations and activities are handled and how the smartphone becomes part of these strategies. First of all, a GPS tracker was used for drawing a map of the participants' physical whereabouts throughout the course of the day. The advantage of automatic logging in this perspective is the possibility of recording movements that are so routinised that people tend to forget them and to identify patterns that people may not necessarily be aware of or able to account for verbally. At the same time, the participants were asked to take a screenshot each time they used their phone – that is, to perform a manual logging of their use. The shortcoming of manual logging, of course, is that it requires some effort on the part of the user and, for this reason, depends on them actually to log their activities in an ongoing and systematic way. The advantage of manual logging, however, is that it builds on the user's own understanding of what counts as an

instance of use that may differ considerably from the logging scheme. For instance, the study in question uncovers certain "invisible uses" such as checking time or checking notifications on the pause screen that are invisible to automatic logging, since the action takes place on the phone, but which may be highly relevant if we are to understand the smartphone as a monitoring device in relation to other communication technologies. Finally, these data were explored and contextualised in follow-up qualitative interviews in order to re-embed the log data in their original contexts on the basis of the participant's verbal accounts and, on this basis, to identify relevant practices of cross-media communication from the user's perspective.

As stated in one of the previous sections, we approach everyday life theoretically as the more or less connected, organized and routinized activities that individuals carry out on a regular basis and which are structured by the demands of our surroundings. The life situation approach represents a key perspective in this regard since it is the particular constellation of job, family and living conditions faced by the individual that defines these demands (Helles, 2012, p. 337). For this reason, participants were purposefully sampled with a focus on maximum variation with regard to life situations including age (ranging from 17 to 51), gender (7 women, 5 men), parental status (4 non-parents, 8 parents), marital status (3 non-married, 6 married, 1 remarried and 2 divorced), and occupation (3 students, 1 freelancer, 4 in the private sector and 4 in the public sector). The highly diverse life situations represented in the empirical material allowed for a detailed comparison of the amounts and types of demands put on the individual participants and how this framed their media use and cross-media communication. For instance, it showed the importance of life situation for the relative mobility of individual participants, the number of given as opposed to negotiable social encounters throughout the day, the number and type of obligations that had to be balanced and prioritized throughout the day and how this framed media use and cross-media communication in particular ways (for a more detailed description, see Thorhauge, 2016). From a methodological perspective, it allowed for some additional considerations on the way in which the collected log data did and did not represent activities throughout the day and how the inclusion of qualitative interview data allowed for a more informed and qualified analysis of the collected log data, which will be explained in more detail below.

Contextualising log data with qualitative interviews

In this section, we will discuss how the combined analysis of automatically and manually logged use data as informed by the qualitative interviews sheds light on the integration of smartphones into everyday practices, including practices of cross-media communication. We provide a critical discussion of the degree to which automatically logged data can be directly interpreted as expressions of such practices. Key to this critical discussion is that

the relationship between smartphone use and related everyday practices is not as straight forward as is sometimes imagined. Smartphones may be used for micro-coordinating (Ling, 2004), interlacing (Baron, 2008) and informing (Bertel, 2013) everyday activities in various ways that have implications for the way it is integrated with everyday practices. Obviously, this has implications for the way use data can be interpreted as a reflection of everyday practices. In the following, we shall focus on three aspects of this issue: 1) smartphone use as something that takes place between activities, 2) smartphone use as primary or secondary activities in everyday life situations and 3) "data voids" as crucial indicators of cross-media communication and everyday practices in general. We shall explain in more detail how the collected log data reflect everyday activities as explained by the participants and how the combined analysis of log data and qualitative interviews allows for a more subtle analysis of the relation between smartphone use and cross-media communication in everyday life.

Smartphone use as an 'in-between' activity

As regards the first perspective, one key difference between automatically and manually logged data, as compared with the participants' verbal descriptions of the day in question, is the degree to which the smartphone represents an "activity between activities". An obvious example is the extensive use of the smartphone while "on the move" – that is, while sitting on the bus, on the train, on the bike, walking to school, taking the children to swimming or soccer practice or, perhaps, just walking back to the office after the lunch break (see also Lomborg, 2015). It is characteristic that the use of the smartphone increases on such occasions and that it covers a wide range of activities of which only some may be related directly to the situation. Among those activities that can be related directly to the situation is the micro-coordination of the immediate situation such as buying bus tickets, checking time schedules, and locating each other when lost. Similarly, some activities have to do with the practical coordination of an upcoming situation such as checking the school's intranet for classroom details, sending a text message regarding an impending meeting or changing work plans in accordance with an employee's notification of illness (see also Ling, 2004 and Bertel, 2013). The example below, for instance, shows the morning of a woman in her 30s who lives in Copenhagen with her husband and her son and has full-time employment as a public housing administrator. Quite a few of the screenshots shown in the illustration can be tied directly to the situation, such as the alarm clock that starts her day a 6:45 and restlessly checking the bus schedule (pink screen) while waiting at the bus stop, whereas the calendar screen right before arriving at work may be interpreted as preparation for the workday.

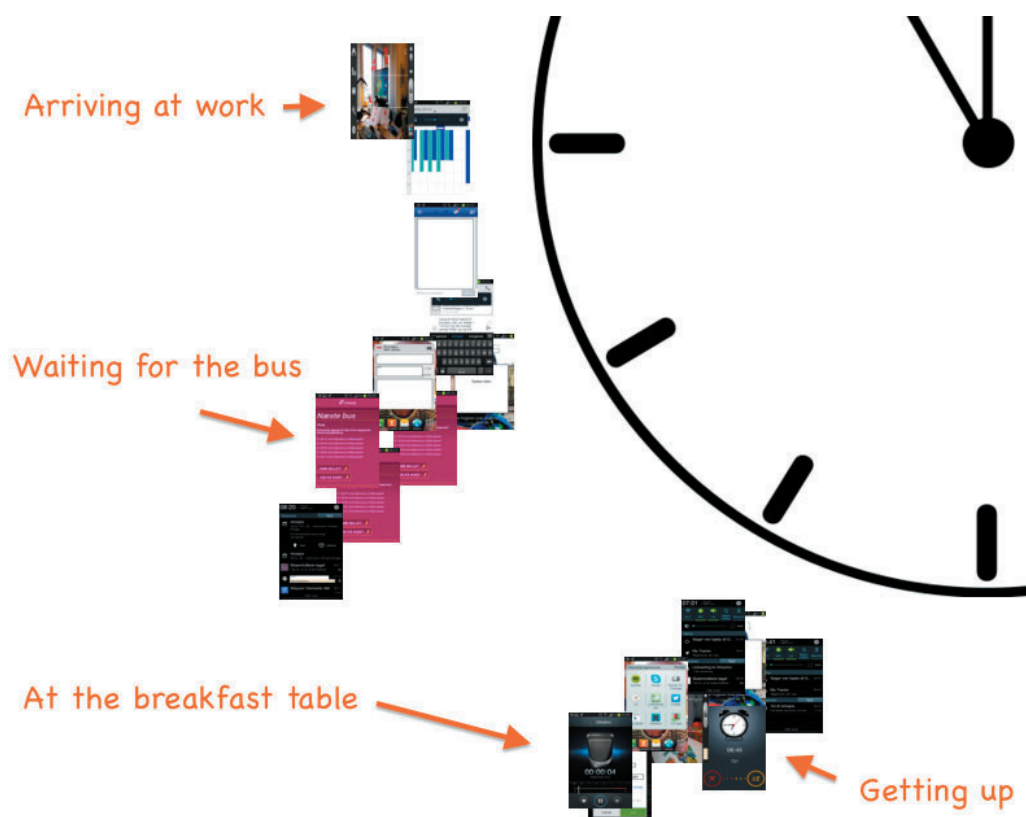


Illustration 1

However, such coordinating activities more or less seamlessly merge into more general planning or recreational activities that cannot be tied directly to the specific situation. For instance, waiting time in a queue may be used to unsubscribe from a magazine, to check on relevant family films in theatres for the upcoming holiday or to write a review on Yelp. On these occasions, smartphone use is only to a lesser degree motivated by something taking place in the immediate or upcoming situation but rather stems from a more general attempt to turn passive time into active time. Moreover, on these occasions, it is sometimes hard to distinguish between instrumental acts of planning or “getting stuff done” and acts of individual pastime and recreation such as flipping through one’s favourite news providers or checking Facebook. Indeed, in some cases, the use can be interpreted as both. Illustration 2, for instance, shows the early evening of a man in his 40s who lives with his wife and two children in Copenhagen and works in the banking sector. On this particular evening, he takes one of his sons to soccer practice around 6 p.m., gets home to grab a sandwich around 7 p.m. and goes to supermarket to buy some groceries around 8 p.m. The only screen that directly reflects these activities is the digital shopping list (the screen with the grey lines), which he updates in the queue and, then, quickly moves on to Facebook.

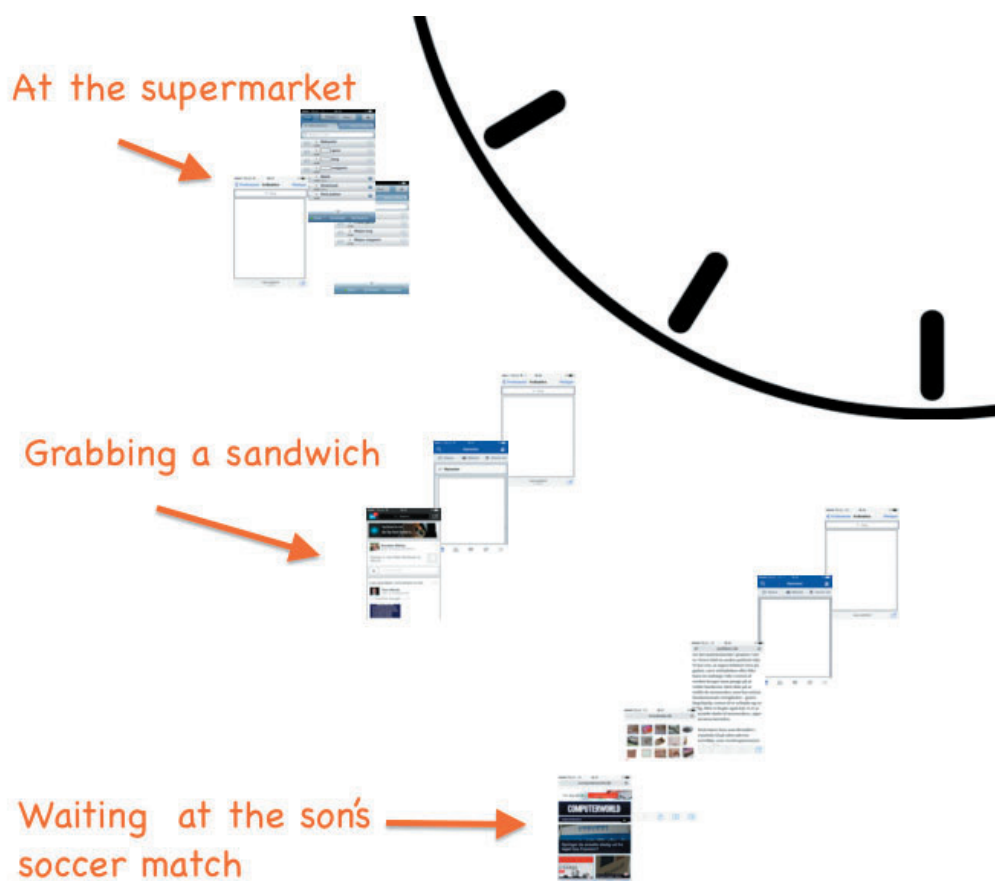


Illustration 2

Since the smartphone is mainly being used here as an activity between activities, the logged use data only represents everyday life indirectly, and the participant's own accounts are crucial for understanding the specific link between log data and practices – even more so because smartphone use may represent either a primary or a secondary activity in everyday contexts.

Smartphone uses as primary or secondary activities

The smartphone is often used for “interlacing activities” (Baron, 2008), thereby creating different types of relationships with other activities in everyday life. In the present study, for instance, smartphone use on some occasions represents a primary activity defined as a situation in which attention is directed primarily toward the phone. Examples of such uses are playing games and listening to audiobooks. However, in most cases, the use of the phone represents a secondary activity taking place alongside other activities such as attending a course, watching television with the family, or during transport (See also Baron, 2008).

The example below shows the morning and lunchtime activities of a man in his 30s who lives in Copenhagen with his wife and daughter. On this particular day, he takes a day off to go Christmas shopping with his family. On the phone, this activity is visible, for instance, when he buys bus tickets to get to the city centre and when he calls his wife because they lose sight of each other. However, alongside these activities, he is planning the refurbishment of an apartment that he and his family are going to move into. This is visible on the phone at the beginning of the day when he is checking prices and calculating costs, and it shows up continuously throughout the day in the form of short exchanges with people on a trading site for used goods. In this way, a portion of the use data identifies a secondary activity taking place throughout the day alongside the recreational trip to the city centre that he is making with his wife and daughter.



Illustration 3

Of course, use is not an either-or phenomenon. Smartphone use may change more or less seamlessly from being a secondary to a primary activity and back again – for instance, when a student loses interest in the course she is attending and directs her full attention to the phone. Indeed, the relative frequency of activities on the phone tends to increase toward the end of school days and work days, indicating that some fatigue may enter at

this point, which diverts attention away from proper school and work activities. At any rate, the status of smartphone use vis-a-vis other activities in everyday life cannot be clarified by looking at use data alone. Again, including participants' own accounts allows for a deeper, more valid analysis of use patterns and how they intersect with other activities in everyday life.

Data voids as valuable entry points for gaining insight into communication in everyday life

Finally, non-use represents a key analytical perspective on the way smartphones are integrated into everyday life. It is easy to lose sight of non-use as a source of analysis in itself. After all, it is difficult to analyse use data that are not there. However, combining the analysis of automatically and manually logged use data with participants' own explanations of the situations in question enables the combined analysis of situations in which the smartphone is in use with situations in which it is very deliberately not in use and the possible linkages between the two. In the present data, quite a few "data voids" turn out to represent focused interactions that are not considered compatible with smartphone use. The most predominant example of this is having dinner with other people. Almost all of the participants who enjoy dinner in the company of others put down the phone while this takes place. The only exception is one of the high school students who combines a café meal in the company of a friend with doing homework and entertaining herself on the phone. Other examples of deliberate non-use include spending time with children or practicing on a musical instrument. The example below, for instance, shows the early evening

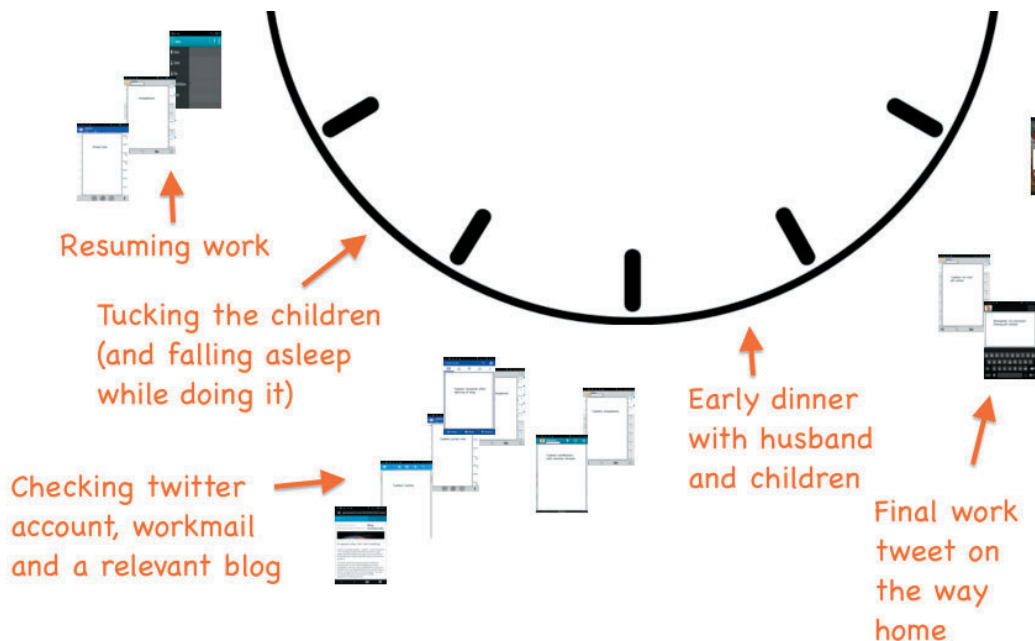


Illustration 4

of a woman in her 30s who lives in Copenhagen with her husband and two children. She has a rather time-consuming occupation and young children, which requires a continuous balancing of conflicting demands, and her solution is to devote certain periods of the day entirely to the children. This is visible in Illustration 4, below, as two “data voids,” one when she arrives home early from work to have dinner with the family and one when she puts the children to bed. After a short nap, she returns to her phone and computer in order to finish her work.

The example is interesting because what this woman herself would probably define as the most central activities of her everyday life are not detectable on the phone. What is detectable are all those trivial manoeuvres that are necessary to make the important things happen. To figure out the rationale behind these use data, it is necessary to ask participants about their non-use. In sum, the rather intricate relationship between smartphone use and other activities in everyday life as documented and discussed in much recent research (Ling, 2004; Baron, 2008; Bertel, 2013) also has implications for the ways in which automatically and manually logged use data can be interpreted as reflections of everyday life. In the illustrations presented above, the everyday logic (Helles 2012) governing smartphone use in relation to activities in everyday life can only be uncovered by combining use data with qualitative accounts of the contexts of use. This goes for everyday practices in general and for cross-media communication more specifically.

Smartphone data, everyday practices and the study of cross-media communication

In this section, we will discuss how the methodological approach and analytical perspectives presented above can shed light on cross-media communication as an aspect of everyday practices. Key to this discussion is that use data cannot be seen as a direct representation of what is going on in everyday life but, rather, as an indirect expression of practices that can be further pinpointed by combining automatically and manually logged use data with participants' own statements.

The inclusion of participants' own statements as well as documented movement patterns throughout the day yields additional perspective on the way cross-media communication is structured by social norms and spatial patterns of everyday life. Participants' descriptions of the documented situations give key information with regard to the types of situations in which simultaneous smartphone use is acceptable, such as communicating on the phone while watching television as compared to checking Facebook while working:

I don't check Facebook on my work computer because I am not sure it is allowed. I don't think it has been explicitly said, but I don't think it is right...

(The woman from illustration 4)

In this way, participants' statements allow for an additional contextualisation of cross-media practices with those social norms that frame them. Moreover, the registered movement patterns yield key insights regarding the degree to which participants are physically stationary or mobile throughout the day and how this frames the combination of media technologies. For instance, the same communication services, such as Facebook, may take place on the computer when people are stationary and on the smartphone when participants are mobile. The same goes for email and news services. Moreover, the relative mobility of individual participants depends on their more general life situation. For instance, students moving between classrooms during the school day are a lot more mobile than employees with stationary offices; and, for this reason, they are more inclined to use the smartphone for activities that would otherwise take place on the computer. The map below belongs to a 17-year-old high school student who lives in a rented room and spends most of the day on the move between different classrooms and, later, shops and cafés. Illustration 7 shows her activity on the phone throughout the school day, which is considerably more frequent than, for instance, what was the case in the former illustration. When contextualised in the follow-up interview, she explains that this is due to her physical movement patterns – communication with peers and groups moves seamlessly between computer and smartphone, depending on whether she is sitting down at a table with the computer in front of her or



Illustration 5

whether she is on the move between classrooms. Had she been stationary throughout the school day to the same degree as the woman in the former illustration, it is likely that more of this communication would have taken place on her computer with a larger screen and keyboard.

The combination of screen dumps, GPS data and verbal statements, thus, provides a deeper understanding of the way the particular life situation (high school student) and context (the school day) frames the way media are combined in particular ways. In sum, when studying cross-media communication as an aspect of everyday practices, it is necessary to be aware that use data only constitute an indirect representation of practices that has to be qualified and contextualised with other data sources. A multi-method approach combining automatically and manually logged use data with qualitative interviews allows for an empirical qualification of the concept of cross-media communication and for a nuanced analysis of the way it is embedded into the norms and spatial patterns of everyday life.

Conclusion

In this article, we have suggested a multiple-methods approach to studying cross-media communication in everyday life, focusing on the combination of smartphone use data with qualitative interviews. First, we have situated the study of smartphone use within a broader context of audience studies and in relation to the classic methodological distinction between text and context. Next, we have discussed the relevance of smartphone use as a perspective on cross-media practices in everyday life and the different types of data the smartphone allows us to collect about these practices. Following from this, we have suggested a multiple methods design that combines automatically logged use data with manually logged use data and qualitative interviews in order to contextualise smartphone use in relation to the spatial and temporal patterns of everyday life. Finally, we have demonstrated how the combined analysis of these heterogonous data allows for a more nuanced and critical assessment of the way smartphone use reflects (cross-media) practices in everyday life.

The key analytical insight yielded by this work is that smartphone use data should not be interpreted as a direct expression of key activities in everyday life as is sometimes suggested by computational social science (Lazer et al., 2009). Smartphone use occurs between activities to a considerable degree. It is often secondary to other activities; and, sometimes, the key to understanding what data actually represent is to be found in the data "voids" or absences appearing in the material. This also has implications for the study of cross-media communication by way of smartphone use data. Rather than merely looking for data that directly express instances of cross-media communication, it is necessary to consider the way cross-media use is embedded in everyday practices and, accordingly, how it may

appear indirectly in data. Such instances of use can be inferred to some degree from location, time of day, mobility patterns and types of apps in use. However, to identify them and to comprehend their grounding in everyday contexts, participants' own statements are crucial.

By integrating diverse types of data that can be collected with smartphones and combining them with participants' own statements, it is possible to provide nuance and to qualify the concept of cross-media communication in everyday contexts. Arguably, the multi-method approach based on the smartphone as a data collection tool adds new opportunities for audience and user studies in general and media ethnography in particular. Traditional ethnographic approaches to studying media use in everyday life, as summed up in the second section of this article, have primarily been conducted by way of participant observation and interviews – which, consequently, puts a great deal of focus on specific empirical contexts such as the home. The smartphone represents a new opportunity for tracking the individual across contexts, thereby shifting the methodological perspective away from specific contexts and toward the way the conduct of everyday life is performed and experienced by individuals.

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