Evolving Mobile Media: Uses and Conceptualizations of the Mobile Internet

Lee Humphreys

Department of Communication, Cornell University, 305 Kennedy Hall, Ithaca, NY, 14853

Thilo Von Pape

Institute of Social Sciences and Communication Studies, University of Hohenheim, 70599 Stuttgart, Germany

Veronika Karnowski

Institute of Communication and Media Research, Ludwig-Maximilians University, 80539 Munich, Germany

Technological convergence has led to the ability to access the internet from a variety of mobile devices. Drawing on the Mobile Phone Appropriation Model (Wirth, von Pape & Karnowski, 2008), we sought to understand how people conceptualize and use the mobile internet by conducting semistructured interviews with 21 mobile internet users, half American and half German in order to explore cross-cultural differences. Findings suggest little cross-cultural difference in use and understanding of the mobile Internet. Users do not perceive the act of ''going online'' as a significant step, even if it is on a mobile device. They do, however, distinguish between different ways of consuming information online (extractive and immersive), relating them to different situations and devices.

Over five billion people worldwide use mobile phones, making it the most popular and rapidly adopted information communication technology in history (ITU, 2010). This development has also impacted internet usage: Within the next 5 years, more people worldwide will likely access the broadband internet via a mobile device than they do via desktop computer (Meeker, Devit, & Wu, 2010). Most of the research on internet use, however, still focuses on access from a computer. Therefore the goal of our study is to better understand mobile internet use. What happens when people are no longer tethered to computer cords through which to harness the power of the internet?

Smartphones, such as the iPhone, Droid, and Blackberry, have begun to reach a significant portion of the mass mobile phone market in affluent countries (Rainie, 2010). However, little is known about how the mobile Internet will evolve. Users have rapidly increasing options in mobile devices and available mobile services, ranging from the classical browser-based web on laptops and netbooks to the highly competitive mobile application or ''app'' market. Our basic assumption is that the evolution will depend on technological compatibility with users' understanding and appropriation of this innovation and the various offers it provides: How will users organize various devices and services in their everyday life?

In response to this question, we combine a user-centered approach on appropriation with a media-ecology perspective. Our theoretical basis is the Mobile Phone Appropriation Model (Wirth, von Pape, & Karnowski, 2008), which integrates approaches from both an adoption-oriented background (Theory of Planned Behavior, Technology Acceptance Model, Diffusion of Innovations Theory) and an appropriation-oriented basis (frame analysis, domestication research, uses-and-gratifications). Research suggests the adoption and appropriation of new media can be culturally influenced (Baron, 2010; Campbell, 2007; Ishii, 2004); therefore we also integrate a cultural comparison between the US and Germany.

In order to explore the users' perspective, we conducted semi-structured interviews with 21 students at a large northeastern U.S. university and two southern German universities. All participants used web-enabled mobile devices (e.g. iPhone, etc) to connect to the Internet.

Theoretical Background

Aiming to study the phenomenon of "mobile Internet" as it presents itself to the user, we base our study theoretically on appropriation research, namely the Mobile Phone Appropriation Model (MPA model, Wirth et al., 2008). What is referred to as the mobile Internet can be considered as a bundle of new services for mobile devices. From a users' perspective, this means that the process of appropriation of mobile communication both is gaining momentum again and changing due to new services.

The MPA model permits us to analyze the process in which new Internet-based services enter into the user's experience of mobile communication. While the MPA model serves as a general framework on the integration of Internet services into the user's mobile communication habits, issues specific to the usage of online services—such as web browsing or information seeking- need to be considered through specific additional concepts.

Mobile Phone Appropriation Model

The framework applied in the present study integrates elements of both social-psychological perspectives on mobile phone adoption and diffusion with more interpretive and qualitative approaches by combining four elements (Wirth et al., 2008):

Usage and handling of the technology in everyday life: This element comprises the decision of adopting a new technology (Davis, 1989; Ajzen, 1985; Venkatesh et al., 2003) and the social process of its diffusion (Rogers, 2003), but also its integration into the spatial and temporal context of the users' everyday life, which is particularly analyzed with the aid of the domestication approach in media studies (Silverstone & Haddon, 1996; Berker, Hartmann, Punie, & Ward, 2006).

The symbolic dimension of prestige and social identity: This element questions how people use the technology in the capacity of a prestige object in order to define their social identity is mentioned by the domestication approach (Silverstone & Haddon, 1996; Haddon, 2006), but also by the uses and gratifications approach in communication studies (Leung & Wei, 2000; Peters & Ben Allouch, 2005; Wei, 2008).

The metacommunication about mobile communication, i.e. the way users negotiate among each other the norms of usage as well as its social significations (Wirth, et al., 2008). This element is particularly treated by the approaches about the social construction of technologies (Bijker, Hughes, & Pinch, 1987; Latour, 2005; Williams & Edge, 1996), but also by frame analysis (Goffman, 1974; Ling, 2004).

The changes that occur over time throughout the course of the appropriation process: Several of the mentioned approaches have developed concepts to describe this process, namely domestication (Silverstone & Haddon, 1996; Haddon, 2004; Haddon, 2006; Lehtonen, 2003), social construction of technology (Bijker et al., 1987; Latour, 2005; Williams & Edge, 1996), uses-and-gratifications (Peters & Ben Allouch, 2005; Wei, 2008) and diffusion research (Rogers, 2003).
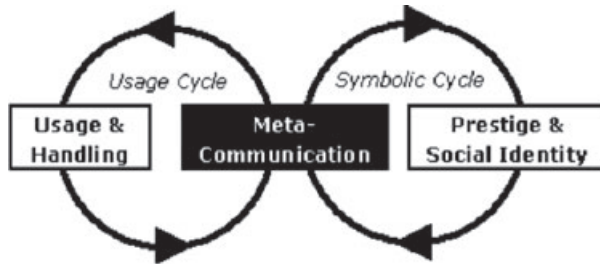
Figure 1 Circular model of mobile phone appropriation (Wirth et al., 2008, a simplified version of the MPA-model)

The continuous evolution of pragmatic usages and their symbolic signification under the influence of metacommunication is described in a circular model. The usage and handling as well as prestige and social identity are negotiated and renegotiated by the users in a continual process (Wirth et al., 2008) (see figure 1).

During this process of appropriation, usage and handling, as well as prestige and the users' social identity, are constantly developing and changing. In time, habitual usage forms emerge and stabilize as well as social evaluations of the symbolic value of certain usage forms, namely their appropriateness or style. However, the appropriation process hardly ever definitely stabilizes, because both the user and mobile communication keep evolving. From this perspective, the mobile Internet usage is one such evolution, giving a new impulse to the appropriation of mobile communication.

Both the usage and the symbolic cycles of the MPA-model can reflect cultural influences. For example, language and metacommunication can reflect the implicit ways people understand and think about mobile technology and can differ across cultures (Campbell, 2007; Ito, Okabe, & Matsuda, 2005). The usage and handling of such technology is also culturally influenced and may reflect cultural norms (e.g. Haddon, 2004; Campbell, 2007; Baron, 2010). While often cross-cultural research focuses on differences between cultures, some comparative mobile communication studies suggest that there may be more similarities than differences in the ways people use and appropriate mobile communication technology (Campbell, 2007; Katz, Aakhus, Kim & Turner, 2003; Schroeder, 2010). On the surface, mobile phone statistics for Germany and the US are indeed fairly similar. In the US 85% of adults use a mobile phone (Zickhur, 2011) and in Germany 83% use a mobile phone (Bitkom, 2011). In terms of mobile Internet use, 38% of mobile phone users in the US access the Internet via their phones (Donovan, 2010), while in Germany 34% use their mobile phones to access the Internet (Hill, 2010).

As mobile communication gets more and more pervaded by mobile Internet services, it is also woven into the wider media context, involving both hardware (docking stations, mobile cameras, mobile audio players) and software (Facebook, Skype) and a few all-embracing software platforms, sometimes referred to as "eco-systems," such as Android or the Apple eco-system involving their respective app-markets. To do justice to this new complex convergence, the MPA-model needs to be complemented by both a more holistic, "ecological" perspective and a more specific focus on the characteristics of Internet use. The next two sections are dedicated to these questions, going from the wider, ecological perspective to the specifics of Internet use.

Ecological perspective on mobile Internet

Smartphones, such as the iPhone or Android, enter an already media saturated environment. Therefore, it is important to understand how this technology fits within the broader array of information and

communication technologies. From a social studies' point of view, several ecological approaches to media change exist already. ''Media ecology'' (Postman, 1971) presents probably the widest and most general framework, underpinning the importance of a holistic perspective on media change, namely to stress the impact of media on our conception of time and space (Innis, 1951, Meyrowitz, 1985). The ''media competition'' approach in uses-and-gratifications takes a Darwinistic understanding of the media landscape and allows us to study how various media compete to fulfill certain gratifications sought for their users and follow strategies of survival such as the specialization to ecological niches. Finally, the domestication approach also applies biological metaphors not only to explain the functional side to media, but also their existence as objects within the user's everyday lifeworld, permitting for studies on the domestic environment as an ecosystem for various media (Quandt & von Pape, 2010) or the lifecycle of various media. A number of studies are dedicated to the domestication of various digital media such as personal computers and the Internet (Bakardijeva, 2005), mobile telephones (Haddon, 2003), multimedia messages (Koskinen & Kurvinen, 2005) and laptops (Vuojärvi, Isomäki & Hynes, 2010). From a media ecological perspective, the most fundamental questions concern the borders between media and the social world and the interaction between them with respect to users' attention and behavior.

The media ecological approach leads us to question how users conceptualize the mobile Internet and the act of accessing it within the larger media environment. Keeping in mind these questions on the mobile Internet as a whole, the analysis of mobile Internet also demands considering the characteristics of Internet use.

Theoretical approaches on Internet use

Mobile online communication provides to ways to access content: browsing the mobile web using the web browser versus using specific mobile apps. In 2010 access via web browser was slightly higher than apps usage (U.S. 26% vs. 25%, EU 25% vs 24%; Donovan, 2010; Hill, 2010).

As an antecedent of web browsing, information-seeking behavior has been analyzed for several decades, even before the emergence of the Internet (e.g. see Chang & Rice, 1993). Individual browsing styles are commonly classified on a continuum from non-goal-directed, open-ended to goal-directed, closed-ended (c.f. Chang & Rice, 1993; Eveland & Dunwoody, 2001; Cothey, 2002). This dichotomy between immersive, rather process-oriented, and sometimes serendipitous media use on the one hand and a more focused, outcome-oriented kind of usage on the other hand is also reflected with respect to e-books, one specific kind of mobile media. Humphreys (2006) differentiates immersive and extractive e-book usage: Immersive reading is when the reader starts at the beginning of the book, is drawn into the story, and reads in a linear fashion; thus immersing themselves in the narrative of the book, reaching a state of ''flow'' (Csikszentmihalyi, 1975). Extractive reading occurs when the reader purposefully reads particular sections of a book seeking out particular information.

App use, in contrast, is a new phenomenon. The most popular apps in the US regardless of the kind of smartphone are game apps, news/weather apps, map/navigation apps and social networking apps (Purcell, Entner, & Henderson, 2010). Other studies on mobile Internet use also confirm the importance of browsing for information (West & Mace, 2010) as well as social networking (Haddon & Kim, 2007; Humphreys, 2008; comScore, 2011). These mobile applications also seem to reflect the continuum between process- and outcome-oriented media usage, known from web browsing.

To take an ecological approach, one must understand the media landscape in which the mobile Internet will be used. Therefore, integrating what we know of online behaviors regarding web browsing and app use with the MPA-model (Wirth, et al 2008), we can begin to better understand how smartphone users conceptualize and use the mobile Internet.

Research questions

Drawing on the theoretical and empirical reflections, our three research questions are: R1) In order to understand how the symbolic and usage cycles of mobile Internet use are linked, how do college students conceptualize the mobile Internet as expressed through metacommunication? R2) In order to understand the appropriation of the mobile Internet in everyday life, in what temporal, spatial, social, and media-related contexts do college students report using the mobile Internet: When? Where? How? R3) In order to understand if and how the cultural context influences appropriation, how do German & American college students understand and use the mobile Internet differently?

Methodology

We decided to implement a qualitative approach to understand the conceptualizations and understandings of mobile Internet by users. Lofland, Snow, Anderson, and Lofland (2006) suggest that qualitative methods are uniquely appropriate for understanding meanings, which they define as ''linguistic categories that define the objects to which we are oriented and thus constitute our reality and influence our action toward those objects'' (p. 132). Thus we used qualitative methods to understand people's meanings of the mobile Internet and how these meanings influence their usage and appropriation of this technology.

Sampling

College students lead the adoption of Internet technologies (Rainie, 2010) and are therefore an important population to study in order to indentify future trends and behaviors associated with new media. Therefore, we recruited 21 college students to participate in the study, 11 American students (n=6 female) and 10 German students (n=5 female). American students were recruited through emailings to undergraduate students in the social sciences, including as psychology, human development, and communication. German students were recruited through e-mailings to undergraduate students in the social and natural sciences. German students were given an incentive of 10 Euros (approximately 15 US$) in cash, while the American students earned extra credit in their courses for participating in the study. There was no evidence to suggest that this difference in incentives led to systematic differences between the German and American participants in the study. A prerequisite for participation in this study was that all students should have experience using a web-enabled mobile device (e.g. Blackberry, iPhone, Palm Pre, Nokia N95, etc.), so that they would be able to describe and reflect on their own use of the Internet on such a device. The protocol for the study was reviewed by the first author's Institutional Review Board and was granted exemption.

Data collection

We conducted semistructured one-on-one interviews with each of the study participants during the fall of 2009. Interviews were conducted face to face in private conference or meeting rooms on each of the college campuses. The interviews were about 30 minutes in length and were conducted by a student research assistant at each of the universities. We purposefully hired student interviewees so that participants might feel more comfortable talking to a peer about their mobile Internet use rather than their professors.

The interview guide was loosely based on the MPA model (Wirth et al., 2008), so we asked about a) usage: where and when they used mobile Internet and how they used it in that context; b) metacommunication: how they conceptualized mobile Internet and how they talked about it with their friends[1]; c) drawing on the ecological framework, we also asked how the mobile Internet use fits within

and compares to their computer Internet use. After collecting, transcribing, and translating all the interview data into English, the first author analyzed the transcripts in consultation with the coauthors.

Analysis

Because we were working with the Mobile Phone Appropriation Model (Wirth et al., 2008) we did not use a purely grounded method approach (Glaser & Strauss, 1967), as we already had initial categories of inquiry. In particular, we focused on metacommunication as well as usage and handling. However, within each of these broad categories we conducted an initial analysis of the transcripts to inductively identify themes or commonalities/differences within each category. We chose two themes to focus on for this paper: 1) characteristics of the mobile Internet identified in metacommunication, and 2) extractive versus immersive uses within usage and handling. Using NVivo, we then coded each transcript line by line according to these three categories. Coding line by line forced us to reconcile discrepant cases and revise our themes in order to take into account seemingly different uses and characteristics. Such systemic analyses and interpretations are important steps to ensure the credibility of qualitative naturalistic research (Lincoln & Guba, 1985).

Results

The results from this exploratory qualitative study of mobile Internet use fall along two key areas. First, we present results related to metacommunication about the mobile Internet, including definitions and characteristics as described by research participants. Second, we present key findings regarding the appropriation and usage of the mobile Internet. Cross-cultural differences were not significant to present on their own, hence we incorporated those differences we did observe within the previous key findings.

Metacommunication: Defining the "mobile Internet"

Overwhelmingly, when asked if they use the term "mobile Internet" interview participants said no. Of the 21 people we interviewed, only six said they had ever used the term and five of them were German college students. The remaining 15 participants said they had never used the term before. A couple participants even laughed when we asked if they had used the term, saying that neither they nor their friends and family had used the term.

Most of the students did not specify mobile Internet, but instead just used the term "Internet" to describe their mobile Internet use. There was no need to differentiate between the Internet and the mobile Internet. For example, Florian simply referred to it as the Internet:

> Interviewer: Ok and have you ever used the expression mobile internet, if yes, in which context?
>
> Florian: No, never. [laughs]
>
> Interviewer: What do you call it?
>
> Florian: I mostly say to go on the internet with the iphone.
>
> Interviewer: OK. And have you ever personally used this term, speaking to other people or anything?
>
> Ydal: Mobile internet. No, not really. I mean I usually just say, ""I'll just Google it," or something.
>
> Interviewer: OK, so you never really used the term "mobile internet"?
>
> Ydal: And I never specify the medium.

The above participants simply refer to the Internet on their smart phones and do not specify 'mobile Internet.' All of the participants were able to understand the term mobile Internet when we asked them to describe it, but they do not necessarily use it in everyday conversation. Despite the fact that Drew could perceive a difference between the Internet and the mobile Internet, his metacommunication did not necessarily reflect this distinction. That said, the need for Florian to specify that he is on the Internet *with his phone* suggests that for some this is still a relatively special medium for accessing the Internet. The fact that Florian and nine other respondents, specify the medium at all suggests that this is not the norm for accessing the Internet. That said, other respondents like Ydal do not specify the medium when accessing the Internet suggesting that it may be increasingly commonplace. Whether participants used the term mobile Internet, specified the medium, or simply referred to it as the Internet, most study participants were nevertheless able to articulate characteristics unique to the mobile Internet.

Metacommunication: Characteristics of the mobile Internet

When we asked participants to describe the mobile Internet, most people said that it was Internet on a smartphone. Several people described the mobile Internet as ''flexible'' and ''on-the-go.'' One German student said, ''It gives me a certain freedom, I am no longer tied to a fixed location.'' For these participants, the salient characteristic of the mobile Internet was—unsurprisingly - its mobility. The importance of mobility is similar to findings from early uses and gratification studies of the mobile phone (Leung & Wei, 2000).

Another commonly described characteristic of the mobile Internet was specifically web access on a mobile phone. Four of the participants described the mobile Internet as the world wide web or web browser on their mobile phone. The availability of the web on the phone was the first thing to come to mind as representing the entirety of the mobile Internet.

> Interviewer: What do you think when you hear the term "mobile Internet?"
>
> Ariana: I guess I think of on my phone I just click Safari and it's just like my laptop. So I guess I just think about that. I know a lot of my friends have Blackberries and they have a really hard time getting on the Internet on their phones, like this web page doesn't look right.
>
> Seth: Mobile Internet, I think about, a more, I guess, restricted Internet . . .
>
> Interviewer: Restricted?
>
> Seth: Yeah. In terms of, some websites, they'll load like a mobile site, and it's just less --you can't access as many things, you can't do as many things with that website as you would the normal website.

For some of these users, the mobile Internet was not only just the browser, but as Seth pointed out, the mobile Internet can also seem restricted. When Internet content providers optimize their mobile interface it sometimes limits the offerings of the website. For people like Seth, the optimization does not outweigh the limitation of mobile devices not having access to everything on the ''normal website.'' For these participants, the mobile Internet was conceptualized as the web browser and not necessarily the other Internet features on the mobile device including e-mail or applications such as Facebook or Google Maps. This is not surprising as the web is often mistaken for the Internet despite being only one specific application running on the Internet (e.g. see Klang, 2008).

Mobile Internet usage & handling

All of our participants in the study had personal mobile devices that could access the Internet. Of the American students, four had iPhones, five had Blackberries, and one had an iPod Touch. Of the German students, seven had iPhones, two had iPod Touches, and one did not disclose what kind of smartphone he had. Of the American students, all of them also had laptops to access the Internet. Of the German students, eight had laptops or netbooks with which they also accessed the Internet. The remaining two German students had desktop PCs at home with which they accessed the Internet.

Immersive and extractive usage patterns characterized the way participants in our study use the mobile Internet on their mobile phones and laptops. Most often both German and American students used their smartphones for extractive mobile Internet use. The most frequent activities they reported involved "checking" e-mail, weather, and maps. The term "checking" is important here because it reflects the extractive nature of the usage. Smartphone users were looking for specific information from the Internet. Did they have new e-mail? What is the weather going to be today? How do I get from here to there? What is the sports score? For example, an American male student, Lester, will only check his e-mail on his iPhone, but would "walk down the hallway to a computer" to type a response rather than respond on his phone. For Lester, the phone is just for checking to see if he has mail. Another American student describes the kinds of things she "checks" on her phone:

> Adrienne: Yeah, I look at the weather on my phone, always. Everyday. [laughs] You have to here. And I pretty much always check my email on the computer, and on my phone. And so I think email, Facebook, and weather are probably the biggest things I check . . . My mobile internet use probably differs from my computer internet use because I check the weather. And I do things that I couldn't do if I had my computer there. Like, I figure out directions for something, or I Google search something. So like immediate gratification kinds of things.

Adrienne describes using her smartphone extractively to get information, particularly about weather. She even goes on to say that a smartphone is "like having an encyclopedia in your pocket." Similarly, Seth, an American student, suggests that the best thing about the mobile Internet is its extractive nature:

> Interviewer: What do you think is the best thing about the mobile internet?Seth: Just that you're able to find out things at the drop of a dime, you know? Whenever you need to find information quickly, or know how to find a word or something that you didn't know, or you need to look something up in the dictionary, you can find it very quickly.

Similarly Tobias, a German student, describes his mobile Internet use as purposeful:

> Well, as already mentioned, I'm often checking my mobile phone [laughs], my email. This I do concerted . . . it depends on the situation. Well, sometimes I'm also looking concerted for information, when I'm in town at night and I want to know, if I should take subway n°7 or n°6, then I'm searching for it with the aid of my mobile phone, which is faster. Something like this, or, for instance when I'm at a shop and I see a 100€ digital camera and I already want to buy one anyway, then, I look for other prices in the internet with my mobile phone, for example. This would also be well-directed.

Tobias describes using his mobile phone to specifically look for information about the subway and prices on cameras. He uses the term "concerted," suggesting that these are focused and extractive uses

of the mobile Internet. Extractive mobile Internet use is often prompted by contextual issues in their environment, which lead both American & German students to want to retrieve or get some kind of information with their devices.

Unlike mobile Internet use on the mobile phone which tended to be extractive, laptop mobile Internet use tended to be more immersive. This is not to say that all laptop Internet use is immersive, but for those participants in our sample who owned both laptops and smartphones, the laptop tended to be used more immersively. Several of the participants were quite thoughtful about the differences between extractive mobile Internet on their phones and immersive mobile Internet on their laptops:

Seth (American student): When I'm on the iPod Touch, I'm more focused on what I want to look at. When I'm on the computer, it gives me more avenues to just kind of wander off.

Ariana (American student): I use my laptop more for work. And then, I use my phone more if I need to check up some quick information.

Drew (American student): I use my phone more than my laptop if it's just a simple search or a rudimentary task. If it's a more involved thing where I'll need to use Flash Player or intense applications, I'll use my laptop.

Anna (German student): I believe the use of mobile internet is much more targeted, so there I know, I have something to do or I know I'll get an email, or I know, it is probably something important there. I then really look when I know that there is something to see and at home [on my laptop] it is more just a leisure activity, that I sometimes jump on without a reason or I stay longer or something like that.

These students each suggest that their phone use is much more purposeful and extractive than their laptop Internet use. Often participants would also suggest that extractive use would be quick and immersive use would be longer. One participant said that he checked his mobile 50 times a day but was ultimately on the Internet longer with his laptop than with his phone. Even though he might check his e-mail multiple times per day, these episodes are very brief, whereas he may use his laptop to be on the Internet 2-3 hours at a time in the evening. This longer usage also tends to be immersive. Immersive use here is not a motivation but a description of use. That is, sometimes immersive use is purposeful such as sitting down to do work and other times it is less purposeful such as surfing online. As described above, immersive use may not demonstrate a clear linearity of thought or progress, but nevertheless, involves getting caught up in the activity of being on the Internet, which occasionally means getting lost or wandering off.

An important point is that sometimes participants used the mobile Internet on their smartphones immersively. Often they would describe scenarios where they were "bored" either in class or in transit and just got on the phones to "surf." This often involved using a social network application like Facebook or StudiVZ (a popular German social network site). Lena, a German student, describes using the mobile Internet in this way:

For example, if I'm sitting in the bus and simply just have free time or even more so when I do a news search about weather or of nothing precisely of particular concern. If I do not think, I just want anything, then I am researching fast online. This can also be time at the seminary (laughs), or even sometimes at home when the notebook is already down, then I'll just use the iPhone still to close the gap and watch quickly (Lena).

Her use of the iPhone to look for news or when she's bored suggests that while the device is well suited for extractive use, that is certainly not its only purpose.

Sometimes students described going online to "check" something and getting caught up in reading status updates or looking through photos. For example, Dyna, an American student, uninstalled Facebook from her phone because it had become too distracting.

> I don't have any type of social media application on my phone just because of that. Because you would get some kind of signal or whatever or vibration and then in the middle of class you pull it out, and then you start browsing. That is one of the reasons why I decided to uninstall it. (Dyna)

A couple students suggested that the worst thing about the mobile Internet was its addictive nature. For example, Lela, an American student, describes her constant need to check her phone for new messages, "If you're bored in class, you'll look [at the phone] until you got something new and you'll check every 10 minutes instead of paying attention in class." Sebastian, a student from Germany, suggested that one can become so immersed in the Internet that one becomes distracted and loses track of time.

> Sebastian: The biggest disadvantage [of the mobile internet] is just really, that you sometimes really partly waste time on it, so you just know that when you are sitting at your laptop at home, and then you are getting from one page to another page, and then there somehow as well and then you are around at StudiVZ, and looking around there on the profile, and suddenly, somehow half an hour has passed, and then you are wondering where the time went.
>
> Interviewer: And that happens to you with mobile internet as well?
>
> Sebastian: Yes unfortunately that does happen to me too. Like I said, so now really in situations, where I actually should pay attention, but they just don't make it that thrilling.

Sebastian suggests that what previously only happened on his laptop can now happen on his iPhone. He recognizes that he should be paying attention but indeed gets distracted by the immersive nature of the mobile Internet on his phone. The mobile phone was not only used for extractive purposes but sometimes immersive as well.

One of the interesting distinctions between immersive and extractive Internet use on smartphones was how they were evaluated. Often extractive usage was identified as one of the things students liked best about the mobile Internet whereas immersive use was sometimes identified as one of the negative feature of the mobile Internet. Both American and German students thought extractive uses were an important and positive feature of mobile Internet access. The negative impacts were either the addictive or distracting nature and were mostly mentioned by American students. The common complaints about the mobile Internet by German students were the high cost and the poor network service of the mobile Internet on their phones. For some American students, the immersive nature lead to a kind of addiction where one student felt she overly relied on her phone:

> Interviewer: What do you think is the worst thing about the mobile internet?
>
> Ariana: It's addicting. [laughter]
>
> Interviewer: What do you mean by that?
>
> Ariana: I feel like I really rely on it. I'm relying on it now, you know what I mean. If I forget my phone somewhere, I freak out.

While a couple of the participants in the study used the term ''addictive,'' we don't want to suggest that this kind of distraction or addiction is necessarily pathological. Based the interviews, it seems that the use of this word reflects a heavy or intense reliance on the phone rather than a true pathology.

Another American student was particularly thoughtful about how he saw the mobile Internet negatively impacting student life:

> Interviewer: What do you think is the worst thing about the mobile internet?Seth: Maybe the fact that people are too focused on their phones some times. You lose a lot of maybe human interaction. Or skills, such as research skills, where you go to the library, you know you used the Dewey decimal system. You used a lot of different old fashion techniques for research. Now it's all becoming, "Oh, let me Google this," or ''let me go to like JSTOR or something''. Whereas the traditional methods of really scrolling through and reading books, you don't get the same, I guess, feeling out of that, that you would when you use just the internet.

Seth's quote suggests two interesting opinions. First, he feels that people are mis-prioritizing communication through their mobile devices over and above face-to-face communication. The mobile Internet distracts them from their physical environment. While this is a common critique of mobile phone use more broadly (e.g. Gergen, 2002), Seth feels that mobile Internet access through the phone further exacerbates this problem. Second, Seth suggests despite its addictive or immersive characteristics, fundamentally the experience of the mobile Internet retains elements of its extractive nature. Thus research becomes superficial and not as in-depth as when one had to go to the library and actually read through books and journals.

While the major differences between extractive and immersive mobile Internet use fall along the mode of access (i.e. extractive use was primarily on the smartphone and immersive use primarily on the laptop or netbook), these differences are not completely mutually exclusive. There was evidence that immersive mobile Internet use can occur on smartphones particularly when people are bored or filling time; and extractive mobile Internet use can occur on laptops where quick answers may be sought through the Internet, particularly when and where mobile coverage is unavailable.

Summary and Outlook

In this paper, we explored how people understand and use the Internet while on the move with their mobile phones and laptop computers. Overall, we found little resonance with the term 'mobile Internet' among our participants. This is analogous to findings from ethnographic research on the Internet by Leander and Vanderbilt: ''Even when researchers begin with the premise that Internet activity and social space is decidedly an 'other' to offline identity and social space, they often appear to find that those more 'native' to online environments do not see their experiences online as remarkable or separated from their day-to-day lives,'' (2003, p. 218). All of our study participants could be considered highly familiar or native with the online environment; the fact that it was being accessed via a smartphone did not to significantly influence the metacommunication about the Internet on these devices.

Those in our study also did not often engage in metacommunication about the mobile Internet and their use of it regardless of whether they used the term itself. This lack of explicit metacommunication about the type of media used to access the Internet is not all that surprising. While people tend to talk about an innovation in earlier phases of the appropriation process, when norms and meanings are still negotiated (cf. Marvin, 1988; von Pape & Karnowski, 2009), people are less likely to explicitly articulate

ideas and questions about the technology as communication technology is increasingly appropriated into everyday life and uses are established and become tacit over time (see Wirth, et al., 2008).

The finding that most of the participants who had used the term "mobile Internet" were German may be explained by language. Typically Americans have referred to mobile phones as cellphones whereas in Europe they have been called mobile phones. Thus the term 'mobile Internet' would be more likely to be used by the German participants than the Americans. Nevertheless, all the participants regardless of whether they used the term were able to describe unique characteristics of mobile Internet use compared to other Internet use.

Our study revealed how the context of usage relates to the way the Internet is used and the device chosen. Like 'classical' web browsing, mobile Internet use can range from immersive, rather process-oriented, and sometimes serendipitous media use to a more focused, outcome-oriented usage. When the context facilitated a more immersive Internet experience they would use their laptops or netbooks, but if the context or situation encouraged extractive uses, people in our study would typically reach for their mobile phones. Hence, the context very much shaped the mode through which people used the mobile Internet. Additionally, the fact of having only a mobile phone at hand could foster an extractive use and make an immersive Internet use less likely. It is important to note that the suggested distinction between immersive and extractive describes *use* rather than motivation. As noted, some of our participants described the fluidity of unintentionally moving from extractive to immersive mobile phone use.

The distinction between immersive and extractive (mobile) Internet use is similar to other forms of new media uses and gratifications, such as ritualized and instrumental motivations. While Metzger & Flannigan (2002) did not explore mobile phone use, they found that the use of new communication technology tended to be both instrumentally or intentionally and ritualistically or habitually motivated. Our exploratory findings, however, do not map clearly onto their motivational typology. Extractive mobile Internet use seemed to involve instrumental as well as ritualistic motivations. Checking the weather or looking for directions on one's smartphone seems to indicate instrumental motivations, but the ways participants described habitually checking Facebook or email, suggests more ritualistic motivations. Similarly immersive use could also be interpreted as instrumental and ritualistic, as well as active and passive. The ways participants described doing research on laptops and browsing social network sites are both immersive uses but may have different motivations and levels of cognitive engagement. Examples of participants going on their phones to extractively "check Facebook" when they are bored in class also seem to suggest there are extractive, ritualistic uses of mobile Internet, but such activities becoming immersive suggest initial motivations and subsequent uses are not always aligned.

With respect to mobile phone use, this study suggests new dimensions that had not been relevant as long as mobile communication was primarily conceptualized as interpersonal. Previous research exploring the contextual aspects of media use compared various modes of communication such as email, phone, IM, and SMS along technological factors (i.e. small screen, synchrony, etc.) and social factors (i.e. to whom is the person communicating and what is the social context of the communication) (Kim, Kim, Park, & Rice, 2007; Licoppe & Smoredab, 2005). These studies often explored interpersonal communication through various media. Our study, however, included web browsing and information seeking. Not limiting our inquiry to interpersonal communication allowed us to begin to explore the contextual factors that influenced various kinds of mobile Internet use.

Another important contextual factor in this study was the increasing prevalence of Internet access more broadly. Most of the people in our study did not use the term mobile Internet, though they often access the Internet from their various mobile devices. The term 'mobile Internet' suggests that somehow the Internet is different when it is the mobile Internet as opposed to the Internet. While this may have

been the case with early Internet access on mobiles via WAP, smartphones such as the iPhone allow users to access and use what often appear to the user as the exact same websites as they would from their laptop or desktop computers. Thus the Internet is the same even though it is accessed on the mobile phone. Despite not using different terms for Internet use from their mobile phones and laptops, we did find differences in use. This suggests that the expectation of Internet connectivity is held such that the mode of access may be less relevant.

While the expectation of access remained, we nevertheless found differences in how participants evaluated different kinds of mobile Internet use. More specifically, immersive mobile Internet use on the laptop was not as critically discussed as immersive mobile Internet use on the smartphone. When students went to extractively check something on the Internet on their phones and it became immersive, the American students were particularly self-critical of their use. Such moralizing about proper and improper use depending on situational factors reflects the emergent social norms surrounding mobile phone and Internet use. It will be important to see how such evaluations change as mobile Internet use changes over time.

The lack of significant cross-cultural differences in our study mirrors earlier findings of greater similarity than difference in global mobile communication use (Campbell, 2007; Katz, Aakhus, Kim & Turner, 2003; Schroeder, 2010). Given the similarity in German and American Internet and mobile phone adoption rates, it is not surprising that mobile Internet use did not differ significantly. It would be interesting to see how meta-communication about mobile Internet use differs in cultures where often people's first and primary experiences with the Internet is on a mobile device rather than a computer (Donner & Gitau, 2009).

Theoretically, this study suggests that an ecological component has to be taken into consideration when studying the appropriation of the mobile Internet. By exploring the greater media context into which the mobile Internet fits, we can begin to identify certain characteristics and situations which facilitate or encourage certain kinds of extractive and immersive uses. Encouraging participants to think about different kinds of contexts of use also revealed meta-communication about the unique characteristics of their mobile Internet use. Therefore, we suggest future studies on the appropriation of new media services using the MPA-model also examine the ecological context into which new media is appropriated.

There are several important limitations of this study. First, the sample that we used is not necessarily generalizeable to a broader population of Americans or Germans. While the qualitative methods employed in this study are good at revealing in-depth understandings and meaning around different mobile Internet uses, it did not reveal such details as length of time or frequency of use of the mobile Internet. These are important features in understanding mobile Internet and future research should aim to explore these characteristics. In addition, despite inquiring about the contexts in which people used the mobile Internet, prior research suggests that consumers of media are not always good at estimating certain details of their media use (Greenberg et al., 2005). Future research should employ other methodological approaches, such as diary studies or the experience sampling method (ESM) (Larson & Csikszentmihalyi, 1983), to allow for better measuring of these details in conjunction with contextual factors to better understand mobile Internet use. Our exploratory qualitative study reveals how participants reflected upon and perceived their own usage but it would be important to link this more concretely with behavioral data such as that collected through diary studies and ESM. Such approaches would also allow for better measurement of situational or contextual factors that influence particular kinds of use. In particular, what are the contextual factors that influence when and how mobile Internet use transitions from extractive to immersive?

Despite these limitations, this study uses an exploratory ecological approach to understand what happens when the Internet becomes mobile. As Internet access becomes increasing available on the move, it is important to put it into a larger context of media use. Drawing on the Mobile Phone

Appropriation Model (Wirth, et al., 2008), we explored the role of meta-communication as well as usage and handling of the Internet on mobile devices. Taking a ecological perspective and comparing mobile phone to laptop or netbook Internet use allowed us to see how technological affordances and social context shaped media usage and handling. Future research should continue to explore the complex ways that people incorporate technology into their everyday lives.

Endnote

1 We also asked about appropriation regarding how their mobile internet use has changed over time, but will not focus on those results in this paper.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.

Bakardijeva, M (2005). *Internet society: The internet in everyday life*. London: Sage.

Baron, N. (2010). Introduction to special section: mobile phones in cross-cultural context: Sweden, Estonia, the USA and Japan. *New Media & Society*, 12(1), 3-11.

Berker, T., Hartmann, M., Punie, Y., & Ward, K. J. (Eds.). (2006). *Domestication of media and technology*. New York: McGraw-Hill.

Bijker, W. E., Hughes, T. P., & Pinch, T. J. (Eds.). (1987). *The social construction of technological systems: New directions in the sociology and history of technology*. Cambridge: MIT Press.

Bitkom (2011). Netzgesellschaft Eine repräsentative Untersuchung zur Mediennutzung und dem Informationsverhalten der Gesellschaft in Deutschland. Berlin: BITKOM. Retrieved from http://www.bitkom.org/files/documents/BITKOM_Publikation_Netzgesellschaft.pdf

Campbell, S. W. (2007). Cross-cultural comparison of perceptions and uses of mobile telephony. *New Media & Society*, 9(2), 343-363.

Chang, S.J., & Rice, R. E. (1993). Browsing: A multidimensional framework. *Annual Reviews of Information Science and Technology*, 28, 231-276.

comScore (2011). Mobile 2010. Year in review. comScore. Retrieved August 2, 2011, from http://www.comscore.com/Press_Events/Presentations_Whitepapers/2011/2010_Mobile_Year_in_Review

Cothey, V. (2002). A longitudinal study of World Wide Web users's information-seeking behavior. *Journal of the American Society for Information Science and Technology*, 53(2), 67−78.

Csikszentmihalyi, M. (1975). Play and intrinsic rewards. *Journal of Humanistic Psychology*, 15(3), 41-63.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.

Donner, J., & Gitau, S. (2009). New paths: Exploring mobile-centric internet use in South Africa. Paper presented at the International Communication Association Preconference on Mobile Communication, Chicago, IL.

Donovan, M. (2010). The state of mobile: U.S. mobile media landscape and trends. *comScore Webinar*, June 9. Retrieved from http://www.comscore.com/Press_Events/Presentations_Whitepapers/2010/The_State_of_Mobile_US_Mobile_Media_Landscape_and_Trends

Eveland, W. P., & Dunwoody, S. (2001). Applying research on the uses and cognitive effects of hypermedia to the study of the World Wide Web. In W. B. Gudykunst (Ed.), *Communication Yearbook, 25* (pp. 79−113), Hillsdale, NJ: Erlbaum.

Gergen, K. (2002). The challenge of the absent presence. In J. E. Katz & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance* (pp. 227-241). Oxford: Oxford University Press.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine de Gruyter.

Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. New York: Harper and Row.

Greenberg, B. S., Eastin, M. S., Skalski, P., Cooper, L., Levy, M., & Lachlan, K. (2005). Comparing survey and diary measures of internet and traditional media use. *Communication Reports*, 18(1), 1-8.

Haddon, L. (2003). Domestication and mobile telephony. In, J. E. Katz (ed.), *Machines that become us: The social context of personal communication technology* (pp. 43-56). New Brunswick: Transaction Publishers.

Haddon, L. (2004). Cultural differences in communication: Examining patterns of daily life. *Mobile Communication and Social Change Conference*. Seoul, Korea. Retrieved from http://www2.lse.ac.uk/media@lse/whosWho/AcademicStaff/LeslieHaddon/KoreaPaperCulture.pdf.

Haddon, L. (2006). Empirical studies using the domestication framework. In T. Berker, M. Hartmann, Y. Punie & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 103-122). Maidenhead: Open University Press.

Haddon, L. & Kim, S.D. (2007). Mobile phones and web-based social networking—Emerging practices in Korea with Cyworld. *The Journal of the Communications Network, 6* (I), 2007.

Hill, A. (2010). The state of mobile: EU5 mobile media landscape and trends. *comScore Webinar*, June 10. Retrieved from http://www.comscore.com/Press_Events/Presentations_Whitepapers/2010/The_State_of_Mobile_EU5_Mobile_Media_Landscape_and_Trends

Humphreys, A. (2006). The past, present and future of immersive and extractive ebooks. In P. Messaris & L. Humphreys (Eds.), *Digital media: Transformations in human communication* (pp. 159-170). New York: Peter Lang.

Humphreys, L. (2008). Mobile social networks and social practice: A case study of Dodgeball. *Journal of Computer-Mediated Communication*, 13, 341-360.

Innis, H. A. (1951). *The bias of communication*. Toronto: University of Toronto.

ITU (International Telecommunications Union) (2010). The world in 2010. Retrieved from http://www.itu.int/ITU-D/ict/material/FactsFigures2010.pdf.

Ishii, K. (2004). Internet use via mobile phone in Japan. *Telecommunications Policy*, 28, 43-58.

Ito, M., Okabe, D., & Matsuda, M. (Eds.). (2005). *Personal, portable, pedestrian: Mobile phones in Japanese life*. Cambridge, MA: MIT Press.

Katz, J. E., Aakhus, M., Kim, H. D., & Turner, M. (2003). Cross-cultural comparisons of ICTs. In L. Fortunati, J. E. Katz, & R. Riccini (Eds.), *Mediating the human body: Technology, communication and fashion* (pp. 75-86). Mahwah, NJ: Lawrence Erlbaum.

Kim, H., Kim, G. J., Park, H. W., & Rice, R. E. (2007). Configurations of relationships in different media: FtF, email, instant messenger, mobile phone, and SMS. *Journal of Computer-Mediated Communication*, 12(4), article 3.

Klang, M. (2008). Internet, Technology of. In W. Donsbach (ed.), *International encyclopedia of communication* (pp. 2455-2461). Malden: Blackwell Publishing.

Koskinen, I., & Kurvinen, E. (2005). Mobile multimedia and users: On the domestication of mobile multimedia. *Telektronik*, 3(4): 60-68.

Larson, R., & Csikszentmihalyi, M. (1983). The experience sampling method. In H. T. Reis (Ed.), *Naturalistic approaches to studying social interaction* (pp. 41-56). San Francisco: Jossey-Bass.

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford: Oxford University Press.

Lehtonen, T. (2003). The domestication of new technologies as a set of trials. *Journal of Consumer Culture*, 3(3), 363-385.

Leung, L., & Wei, R. (2000). More than just talk on the move: Uses and gratifications of the cellular phone. *Journalism and Mass Media Quarterly*, 77(2), 308-320.

Licoppe, C., & Smoredab, Z. (2005). Are social networks technologically embedded? How networks are changing today with changes in communication technology. *Social Networks*, 27(4), 317-335.

Lincoln, Y. S., & Guba, E., G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Ling, R. (2004). *The mobile connection: The cell phone's impact on society*. San Francisco, Oxford: Elsevier/ Morgan Kaufmann.

Lofland, J., Snow, D., Anderson, L., & Lofland, L. H. (2006). *Analyzing social settings: A guide to qualitative observation and analysis* (4th ed). Belmont, CA: Wadsworth Publishing.

Marvin, C. (1988). *When old technologies were new: Thinking about electric communication in the late nineteenth century*. New York: Oxford University Press.

Meeker, M., Devit, S. & Wu, L. (2010). ''Internet Trends.'' Retrieved from http://www.morganstanley.com/institutional/techresearch/pdfs/internet_Trends_041210.pdf

Metzger, M. J., & Flanagin, A. J. (2002). Audience orientations toward new media. *Communication Research Reports*, 19(4), 338-351.

Meyrowitz, J. (1985). *No sense of place*. New York: Oxford University Press.

Peters, O., & Ben Allouch, S. (2005). Always connected: A longitudinal field study of mobile communication. *Telematics & Informatics*, 22(3), 239-256.

Postman, N. (1971). "What is media ecology?" Media Ecology Association. Retrieved from http://www.media-ecology.org/media_ecology/#What is Media Ecology?

Purcell, K., Entner, R., & Henderson, N. (2010). *The rise of apps culture*. Washington, D.C.: Pew internet and American Life Project.

Quandt, T., & von Pape, T. (2010). Living in the mediatope: A multi-method study on the evolution of media technologies in the domestic environment. *The Information Society*, 26(5): 330-345.

Rainie, L. (2010). *Internet, broadband, and cell phone statistics*. Washington, D.C.: Pew internet and American Life Project.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.

Schroeder, R. (2010). Mobile phones and the inexorable advance of multimodal connectedness. *New Media and Society*, 12 (1), 75-90.

Silverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Silverstone & R. Mansell (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 44-74). Oxford: Oxford University Press.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

von Pape, T. & Karnowski, V. (2009, May). *Stumbling mobile? A longitudinal study on the appropriation of mobile television*. Paper presented at the 59th Annual Conference of the International Communication Association, Chicago.

Vuojärvi, H., Isomäki, H., & Hynes, D. (2010). Domestication of a laptop on a wireless university campus: A case study. *Australasian Journal of Educational Technology*, 26(2): 250-267.

Wei, R. (2008). Motivations for using the mobile phone for mass communications and entertainment. *Telematics & Informatics*, 25(1), 36-46.

West, J. & Mace, M. (2010). Browsing as the killer app: Explaining the rapid success of Apple's iPhone. *Telecommunications Policy*, 34(5-6), 270-286.

Williams, R., & Edge, D. (1996). The social shaping of technology. *Research Policy*, 25, 856-899.

Wirth, W., von Pape, T., & Karnowski, V. (2008). An integrative model of mobile phone appropriation. *Journal of Computer-Mediated Communicationn* 13(1), 593–617.

Zickhur, K. (2011). *Generations and their gadgets.* Washington DC: Pew Internet & American Life Project.

About the Authors

Lee Humphreys (Ph.D., Annenberg School, University of Pennsylviania) is an Assistant Professor in the Department of Communication at Cornell University. She studies the social uses and perceived effects of communication technology. Please direct all correspondences to Lee Humphreys, Cornell University, 305 Kennedy Hall, Ithaca, NY, 14853, or via email at lmh13@cornell.edu.

Thilo von Pape, Ph.D., (University of Zurich) is a Research Associate at the Institute for Communication Studies at the Hohenheim University in Stuttgart, Germany. His research focuses on mobile media and communication, online communication and the diffusion and appropriation of new information and communication technologies.

Veronika Karnowski (Ph.D., University of Zurich) is an Assistant Professor in the Department of Communication Studies and Media Research at Ludwig-Maximilians-University Munich, Germany. Her research focuses on mobile and/or online communication and media, as well as diffusion of innovations theory. She is especially interested in how people do integrate new media into their everyday lives.