Portable Objects in Three Global Cities:
The Personalization of Urban Places

Mizuko Ito, Daisuke Okabe, and Ken Anderson

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Abstract

The mobile phone has become the central node of the ensemble of portable objects that urbanites carry with them as they negotiate their way through information-rich global cities. This paper reports on a study conducted in Tokyo, Los Angeles, and London where we tracked young professionals' use of the portable objects. By examining devices such as music players, credit cards, transit cards, keys, and ID cards in addition to mobile phones, this study seeks to understand how portable devices construct and support an individual's identity and activities, mediating relationships with people, places, and institutions. Portable informational objects reshape and personalize the affordances of urban space. Laptops transform cafés into personal offices. Reward and membership cards keep track of individuals' use of urban services. Music players and mobile devices colonize the in-between times of waiting and transit with the logic of personal communications and media consumption. Our focus in this paper is not on the relational communication that has been the focus of most mobile communication studies, but rather on how portable devices mediate relationships to urban space and infrastructures. We identify three genres of presence in urban space that involve the combination of portable media devices, people, infrastructures, and locations: cocooning, camping, and footprinting. These place-making processes provide hints to how portable devices have reshaped the experience of space and time in global cities.

Introduction

Much of the public discourse and research on mobile media has focused on how they transcend the constraints of time and space, in the process often disrupting the integrity of face-to-face encounters and locations such as restaurants, movies, and public transportation. In addressing these issues, research has tended to focus on a specific device, the mobile phone, and on interpersonal communication as the primary mode of usage. While private communication on the mobile phone continues to be an important social and research site, in this paper we shift our focus towards mobile media that involves interfacing with particular locations and infrastructures. We examine not just the mobile phone, but the whole range of portable objects that people use to inhabit, navigate through, and interface with urban environments. This includes objects like media players, books, keys, credit and transit, ID, and member cards that comprise the information-based "mobile kits" of contemporary urbanites. By expanding the object of mobile media

studies to include this more diverse ensemble of portable informational objects, we seek to understand the diverse ways in which information and communication technologies shape our experience or urban space and time. The expanded focus also enables us to consider the convergence between objects like transactional cards, media players, and keys with the mobile phone or PDA.

This paper reports on a study conducted in three global cities—Tokyo, London, and Los Angeles—where we tracked young professionals' use of portable objects. By examining the ensemble of objects in a mobile kit, this study seeks to understand how portable devices construct and support an individual's identity and activities, mediating relationships with people, places, and institutions. By examining the use of portable objects for navigating, interfacing, and transacting with urban location and services, we shift our focus away from private, interpersonal communication towards more public, impersonal and instrumental kinds of social exchanges. What kinds of social and informational activities does an individual engage in when moving about different urban environments and between home and work? How do portable ICTs change how we occupy urban space and time? After first introducing our study and research approach, this paper discusses three ways of being present in urban space that involve the combination of portable media devices, people, infrastructures, and locations: cocooning, camping, and footprinting.

Research Framework

Our Study

The study reported on here was conducted as a collaborative effort between the Docomo House research lab at Keio University and the People and Practices group at Intel Research. Our goal was to document what people carried around with them in locations outside of the home and office, how these objects were used to for transactions and communication, and how they differ between different cities around the world. We were also interested exploring new methods for documenting practices that are very low-key, ongoing, and difficult to observe. All of these research objectives were extensions of our existing research in mobile communications, where we are seeking to understand how information and communication technologies are being integrated into ongoing, pervasive, everyday social interactions and transforming them in subtle ways.

The study centers on a diary-based methodology, adapted from the "communication diary" studies we have used to study mobile communication and camphone use (Grinter and Eldridge 2001; Ito and Okabe 2005; Okabe 2004). We adapted these methods to include a larger set of portable objects and to take into account the specificities of different urban contexts. For example, the record keeping via mobile text input which works well in the pedestrian context of Tokyo was not appropriate for the car-centered infrastructures of Los Angeles. Study participation took place in four stages:

1. An initial interview, including a survey of everything participants were carrying in their car, pockets, bags, wallets, etc.

2. One or two days of diary keeping, where participants documented every time they used something out of their mobile kit. The actual method of self-reporting this data varied by site; paper diaries (London), voice recorders (LA), and moblogs (Tokyo). The media for recording were meant to cause the least amount of intrusion in the particular city's infrastructural context.

3. A "shadowing" session in which a researcher accompanied a participant on a normal or routine activity such as shopping, commuting, or other trip through the city.

4. A final interview, including a review of their diary and a photo-elicitation exercise. The interviews relied on the diary records as the primary basis for discussion, and are the source of all the quotes reported on in the body of the paper.

In all three cities, we recruited young professionals, aged 22 to 32 aiming for an even split between genders. The participants were recruited through local academic and professional contacts. As is common in ethnographic work, the sample was selected for theoretical interest and trust relationships with the researchers rather than for statistical representation. Our research seeks to understand current patterns among specific populations, as well as considering the ways in which technology uses are likely to evolve in the future. Thus we sought young professionals who were likely to be leading-edge users of new mobile technologies, and spend time in a diverse range of urban spaces. Teens have been the early adopters of many mobile technologies centered on social uses. For this study, however, we were interested not only in social communication but also issues such as financial transactions and work related uses, among a population that have the resources and freedom to make full use of urban space. For these reasons, many participants were in the area of new media, including design and media industries, and we recruited a substantial proportion of freelancers who were engaged in work outside of the home or office. We focused on individuals transitioning into the workforce from study at elite universities, as they could be expected to be both tech savvy and confronted with novel challenges, and thus potential early adopters and influencers. A total of 26 individuals participated, 12 in London, 8 in Los Angeles, and 6 in Tokyo. These sites were selected as major world cities with differing cultural, physical, and technological infrastructures. The differences in number of participants in each city was due to practical issues in recruiting and the time that researchers had at each location to conduct the fieldwork.

Conceptual Framework

Research on mobile phone use has thus far focused on interpersonal communication rather than impersonal or transactional social exchanges. One of the most significant technosocial changes heralded by the mobile phone was the shift in the locus of remote communication away from location-based networking to person-based networking. Reflecting this, study of mobile communications has tended to focus on a specific device—the mobile phone—and a specific set of activities—personal communication. What are the implications for interpersonal relationships and interactions when communication is channeled through a personal communications device? Research in a variety of locations around the world has documented the implications of this shift for

interpersonal communication, examining the rise of "virtual walled communities" (Ling, 2004), "telecocoons"(Habuchi, 2005), "networked individualism" (Wellman, 1999), or "full-time intimate communities" (Yoshii *et al*., 2002). Given this focus on personal communications and personal addressing, research on place and time in relation to mobile communication has centered on the disruptive effects of private communication in public space (Ling, 2002; Murtagh, 2002; Okabe & Ito, 2005; Plant, 2002; Weilenmann, 2003). Private communications via the mobile phone were seen as transcending the constraints of local place and time, often disrupting the social logic of public places.

Our work thus far has also focused on personal communication, but we are beginning to turn our attention to a more diverse set of social interactions and transactions being mediated by portable ICTs. Although mobile phones are multi-function devices that can include games, calculators, planners, and information access capabilities, very little social research has examined these types of features. With the expansion in function of the mobile phone to include photos, videos, music players, digital cash, more sophisticated games, and web applications, we are beginning to see more research on uses of the mobile phone that are not exclusively about interpersonal communication. For example, research on camera phones has opened up a dialog about photography and visual archiving in relation to mobile media and communications (Kindberg *et al*., 2004; Koskinen, 2005; Ling & Julsrud, 2005; Okabe & Ito, 2006; Riviere, 2004; Van House *et al*., 2005; Van House *et al*., 2004). Other emerging research on mobile media includes work on electronic wallets (Cooper *et al*., 1999; Mainwaring *et al*., 2005) mobile gaming (Licoppe & Inada, 2006; McGonigal, 2006), and much research in the area of ubiquitous and pervasive computing. As we have shifted our focus towards practices such as media capture, consumption and economic transactions, our analytic focus also shifted to include a different set of social negotiations, including different ways of understanding the relationship between mobile media, place, and time. In this paper, we are specifically interested in the question of how portable ICTs change our relationships to urban space and services.

In a location-centered analysis, the issue of private communication in public places is just one of many forms of social frames that people negotiate with their mobile communications technologies. As people navigate the urban environment, they selectively display aspects of their public identities to interface with local social and infrastructural resources, swiping a transit card at a ticket wicket, or displaying a membership card to get into the gym. They appropriate public and semi public spaces by pulling out a laptop in a café, or donning headphones in a crowded train to create a private cocoon. Our focus in this paper is on these ways of interfacing with urban place, and social transactions with anonymous others, media, infrastructure, and services. Here we deal with private communication only to the extent that it represents a posture within public space, such or as when somebody will become absorbed with their mobile phone in a bar or train to avoid contact with others in the shared physical space. In other words, we are not analyzing the content of private communications and relations, but rather the ways in which communication and identity play out in public and semi-public places and infrastructures.

The study of interfacing with infrastructures and urban locations has unique methodological problems that differ from the challenges we have faced in the study of private communication. Unlike interpersonal relations where most people have a great deal of personal and emotional investment, relations with urban infrastructures and locations often barely rise to the level of consciousness for most people. As Susan Leigh Star (1999) has suggested, ethnography of infrastructure is the "study of boring things" (377). Star also argues, however, that it is crucial that infrastructure be examined from a social and cultural perspective, and that these embedded and often unnoticed structures represent some of the most pervasive and foundational scaffolds of everyday social life. Building on Star's framework, Paul Dourish and Genevieve Bell (2007) have suggested that the study of technology and place, and ubiquitous computing in particular, needs to be informed by looking at "infrastructures as fundamental elements of the ways in which we encounter spaces—infrastructures of naming, infrastructures of mobility, infrastructures of separation, infrastructures of interaction, and so on." Their project is to examine "how the infrastructures of space and pervasive computing are mutually, reciprocally coupled to social and cultural practices." As new kinds of instrumental, transactional, and media related functions are being implemented for mobile phones, it becomes even more crucial that mobile communications research look at these more infrastructural and impersonal forms of social and cultural practice. Infrastructure represents social negotiations embedded in taken-for-granted technical forms. Paul Edwards, Steven Jackson, Geoffrey Bowker, and Cory Knobel note in their report "Understanding Infrastructure" (2007, 27) note:

> … infrastructure is a deeply distributed phenomenon, involving actors of many types and levels. The variety of positions vis-à-vis infrastructure can lead to widely variant experiences and responses to infrastructure—many or all of which will need to be taken into account if the process of infrastructural development is to move forward effectively.

This paper is an effort to understand the experience of people on the "end-user" side of the infrastructure equation, people who are not part of the high stakes political and economic negotiations around infrastructure development, but who are nonetheless vital participants in the process.

Dourish's phenomenological approach to pervasive computing, which he describes in greater detail in his book on embodied interaction (Dourish, 2001), provides a conceptual bridge between infrastructure studies and our prior frameworks for studying private communication in public spaces (Ito *et al.*, 2005; Okabe & Ito, 2005). In our past work, we have relied on an adaptation of Goffman's (1963) approach to how people behave in public space to examine new hybrid "technosocial" setting for behavior that hybridize public and private frames (Ito & Okabe, 2005). With this paper, we adapt this framework to consider how people display identity and mobilize communications technology not only for other people, but also in order to interface with locations, services, and infrastructures. Dourish (2001) describes how computers have "moved off the desktop" and "designers of interactive systems have increasingly come to understand that interaction is intimately connected with settings in which it occurs" (19). By examining

how portable technologies are part of our embodied presence in specific locations of interaction, we can begin to understand new technosocial configurations that couple devices, locations, infrastructures, and behavior into recognizable genres of social practice. Just as in prior work we have identified new "technosocial situations" for behavior structured by text messaging, in this paper we suggest certain behavioral frames, or "genres of presence" in public space that involve people's use of portable information technologies in inhabit locations and interface with infrastructures.

Managing Presence in Urban Space and Time

In our analysis of our participants' mobile kits, we identified a wide range of different types of objects, including the mobile phone, snacks, toiletries, record-keeping devices such as planners or receipts, access mechanisms such as ID cards, member card and keys. In this paper, we focus only on those objects and activities that center on managing presence in urban space. Our three genres of presence (which can also be considered a form of place-making) are cocoons, encampments, and footprints. These are technosocial modes of engaging with urban spaces that rely on a stabilization of technology, social practice, and infrastructural standards. These are also genres of presence that we saw occurring in all three of the cities we studied, despite substantial differences in urban contexts. Clearly some of the specificities of the technology and practice varied depending on factors such as the prevalence of digital cash systems or the centrality of public transportation. We discuss the variability of practices across locations in the course of the following description. Although we can not verify this through this study, given it's limited scope, our sense is that factors such as generational identity, class identity, and profession may be factors that are as important as national context in determining variability in how people mobilize different genres of presence in urban space. And clearly the difference between the dense urban contexts we have examined here and suburban and rural context will even more decisively inflect different genres of presence. Comparisons of this kind, however, are beyond the scope of this current analysis.

We describe our material in terms of theree genres of presence in urban space: cocooning, camping, and footprinting.

Cocooning

One of the primary functions of mobile media that is carried in public and semi-private places is to provide a personalized media environment that is attached to the person and not the physical place. Almost all of our research participants carried around devices and media that were meant to create a cocoon that sheltered them from engagement with the physical location and co-present others, a private territory within the confines of urban space. Mobile phones can function as a cocooning technology, such as when people text message or browse the web when they are alone in places like trains and cafes. Portable media devices of various kinds, however, are more emblematic of this kind of social function in that they are explicitly carried to provide a focus of attention that shelters an

individual from local social and spatial interactions. These include music players, as well as books, newspapers and magazines. Cocoons are micro places built through private, individually controlled infrastructures, temporarily appropriating public space for personal use. They involve a complex set of negotiations that take into account the presence of others in the vicinity, while also working to shut them out. These cocoons also have specific temporal features, functioning as mechanisms for "filling" or "killing" in-between time when people are inhabiting or moving through places that they are not interested in fully engaging with. We see cocoons operating most commonly when people are in transit or when they are killing time while waiting in a location that doesn't otherwise contain much that is of personal interest. In other words, cocoons transform "dead time" in incidental locations into time that is personally productive or enriching.

The most common type of cocoon we documented was the use of different media devices in public transportation. In London and Tokyo, where all of our participants relied on public transportation, some kind of cocooning media in addition to the mobile phone was always present in the mobile kit. Without exception, all participants in London and Tokyo regularly carried reading material with them. With the exception of two participants in London and two in Tokyo, all of the participants from these two locations also carried a music player as a standard part of their mobile kit. Cocooning technologies are considered crucial for people who have commutes of any length. Music players are particularly valuable in environments that are very crowded. As one subject in Tokyo notes, "without my MP3 player, crowded trains would be unbearable." A woman in London says that she uses her iPod on the tube "to avoid unwanted conversations." She finds that there are guys "who take the tube as an opportunity to try to pick up women… there aren't many of them but it happens to me at least a few times a week but never when I have my iPod on."

The combination of a music player, headphones, and reading material creates an ideal, compact, cocoon that enables effective escape from involvement in the physical setting in a way respectful to others in the vicinity. For example, in London, "Peter" takes a *National Geographic* with him on all commutes. He connects his iPod, then opens up the *National Geographic* and reads all the way home. He has the *National Geographic* timed to take just about 2 weeks of commutes. He then switches over to a business magazine. The *National Geographic* however is "his time", a time of "retreat" from daily life and to "refresh". When he is done, he leaves the magazine on the tube as a present for other travelers to enjoy – a chance for them to go "on holiday on the way home."

In Los Angeles, with its more sprawling urban environment and car-centered transport system, the dynamics of cocooning differ substantially From Tokyo and London. The car functions as its own private cocoon within the urban transit infrastructure. All 8 of the Los Angeles participants reported listening to radio or music in their car. They all also reported that they used their drive time to catch up on voice calls. Unlike the case of public transit commuters, car commuters work to optimize their audio rather than visual input. For example, one of our male Los Angeles participants describes how he tries to leave the house near the top of the hour, at 8:28 for example, so he can be sure to catch the news on National Public Radio. Another Los Angeles participant describes how he

takes his iPod with him wherever he goes. "If I go to fill up my car with gas, which is five minutes away, I bring it just to have it." He describes his complicated process of plugging and unplugging his iPod from car and body as he moves from car to gym and other environments, but that does not deter him for carrying it with him everywhere. This transition from inside and outside of the car was a constant struggle for people with digital music players. The five LA participants with MP3 players tried with varying degrees of success to use in their car. Discussion with participants about the personalization of their audio environment in their car brought up numerous areas of frustration. Participants in LA ended up relying largely on radio because of these difficulties.

Although the dynamics of media cocooning differ depending on whether people are walking, driving, or using public transportation, there are common characteristics. In all cases, people are mobilizing private media infrastructures within public infrastructures to momentarily claim them for personal space. People shut out involvements with the auditory and social environment that is physically local to them in environments that they have only a passing relationship to them. In other words, they see their relationship to environments that they pass through on their way to different destinations as temporary and limited. People generally make efforts to maintain the boundary of their cocoon, shielding their micro personal space from the broader shared context. Readers or mobile phone users on the train posture so their texts are not readable to others. Headphones shelter individuals from the ambient audio as well as sheltering others from the personal audio. The leakage between personal sound and public sound in the case of mobile phone talk has continued to be a site of social tension because it fails to adhere to the norm of cocooning of personal media (Ling 2002, Okabe and Ito 2005). Although some people might shoulder boom boxes or leaving their car windows open to broadcast their music, among those we studied the norm was clearly to maintain a boundary between personal audio and the ambient environment.

Camping

Another category of hybrid and person-centered place making that we observed among our participants was the process of constructing personal work space "encampments" by bringing portable media to public places of choice. The most common form of encampment involved using cafes and other spaces like libraries or public parks as places to camp out and work. This is not a ubiquitous practice like we see with media cocoons, but something that we only saw with a small subset of our participants, primarily those who did not rely exclusively on office-based infrastructures for their work. Although this was a minority of the population in our study, it was a thread that cut across the three different cities. Two participants each in Los Angeles, two in Tokyo, four participants in London engaged in this form of place-making. These participants were all engaged in freelance work or personal hobbies, suggesting there are commonalities of practice for this category of activity, regardless of the specific city or national context. Unlike the case of media cocoons, where people do not have a specific personal investment or interest in the places they are passing through, in the case of encampments, people appropriate places where they feel some affinity. They put down roots that have temporal

limits, but are more extended than commuters who are simply passing through. Rather than "killing time" in incidental and in-between places, encampments involved "spending time" and "scheduling time" in desirable locations outside of home and office. The location is a specific destination that people seek out and have a personal relationship with. They will often have a mobile kit that is specifically tailored for setting up camp, including bulkier devices like laptops or scanners that are not part of their more stripped down mobile kit.

In Los Angeles, "Bob" works as a freelance writer, and likes to work at his favorite café on the west side. His use of a neighborhood café epitomizes the hybrid place that we call an encampment. He uses the café as an office where he focuses on writing, unlike his home office that he uses to connect to the Internet to surf and blog. For Bob, the space of the café is a social space where he has developed relationships and put down roots. He is a regular who is known by the café staff and other patrons, and uses it as a space to meet with his collaborators. He feels comfortable enough there that he will even have food delivered to the café from other restaurants. When he sits down to write, however, he faces his laptop and cocoons with the use of his MP3 player. "I need something to tune out, that I like to write with. I can't write in silence." His mobile kit, when going to the café always includes reading material, his laptop, and his MP3 player. He does not connect to the Internet while he is there, because his goal is to focus on writing screenplays. In other words, the space of a neighborhood café provides personalized social resources, food, and a distinctive ambience that makes it an attractive destination for Bob to camp out in with his gear.

A graphic artist in LA, "Cara" similarly describes how she will carry her laptop and a scanner with her to libraries and cafés to work outside of her home office. She generally travels by bike with a very stripped down mobile kit that fits in her pockets, but when she is going to camp out somewhere she uses her backpack with her larger media devices. She utilizes resources in the library, so there is a practical reason for her to camp out at that location, but her choice to work in cafés is based on ambience and the pleasure of working outside of the home. Encampments are created by people who are engaged in freelance work as well as people who have hobbies or educational pursuits that they engage in outside of the home and office. "Gai" in Tokyo describes how he uses his local library and Starbucks as a space of retreat that differs from his weekday worker identity. He has a separate purple bag that contains a different mobile kit from his weekday briefcase, which he takes to the library to read and study on the weekend. Gai also makes an effort to have a more personal relationship with his local Starbucks where he also likes to encamp. He leaves a personal mug there that marks him as a regular. Another participant in Tokyo, who likes to write on his PDA in family restaurants and other semi-public places, describes how his "brain feels more lively" when he is in places occupied by others.

Most participants did not specifically seek out Internet infrastructures when they worked in cafés or public places, but for three of our London participants this was an important factor. For example, "Lacey" generally carries her laptop with her, and regularly uses public access WiFi. She worked her way through a series of wireless access cards, and

she carried two at the time that she participated in our study. Her husband provided her with ones that gave her free time for 30 days. Between those and free WiFi locations she could usually get a connection. There used to be more free wireless around London, she explained, but over the past year places that were once free were now charging through some new wireless companies. Her most frequently used one was called "The Cloud" which worked at her favorite coffee shop.

In some cases the boundaries between a cocoon and an encampment are somewhat indistinct. A more subtle example of seeking out public space to camp out comes from one of our Tokyo participants, who on occasion rides a bus rather than a train, even though it takes more time. He says he prefers the ambience of the bus: "I enjoyed the scenery from inside the bus… I like looking out at the town. The inside of a bus has a relaxed feeling." Presence in a vibrant public space is central to cocooning as well as camping out in urban space. In the case of cocooning, however, people generally experienced it as a practice of shutting out a hostile or undesirable environment, but in the case of encampments, people saw value in residing for a period of time in a desirable location. Just as people seek out beautiful campsites to set out there gear and reside for short periods of time, urbanites find attractive public places to temporarily set up camp with the help of their information technologies. The attraction of working in a specific "camping site" can include the personal relationships fostered there, food and drink, infrastructures (tables, electricity, WiFi), and most importantly, diffuse social ambience. With the current crop of technologies such as laptops and MP3 players, people can enjoy having both their rich personal media and workspaces as well as the benefits of an ambient public or service-oriented space.

Footprints

Portable information devices provide opportunities for personalization of public and semi-public spaces in the form of cocooning and encampments, but also in the form of individualized relationships to commercial establishments. In the case of cafés, we've seen how people develop personal relationships over time that make certain locations desirable campsites. In the cities we studied, a more typical way of establishing and maintaining relationships to restaurants, shops, and transit infrastructures is through the mediation of various member, reward, stamp, and access cards. In all three of the cities we examined, we were struck by the proliferation of different cards within the wallets of our research participants. As we investigated this category of "information object" further, we came to realize that people are increasingly relying on these relatively systematic and information-based systems for managing their relationships with urban services. The cards that we find in people's wallets perform a wide variety of financial and social functions, but here we are specifically interested in how cards mediate and personalize people's relationships to various establishments in urban space.

The process of maintaining records of customer transactions can be considered a process of "footprinting" or leaving traces in a particular location. Unlike the case of cocooning and encampments, customer footprinting is a process that is largely driven by the particular location-based establishment rather than by the individual. Footprinting is the

process of integrating an individual's trajectory into the transactional history of a particular establishment, and customer cards are the mediating devices. In the case of large global cities that often are populated by transplated and transient populations, individuals and businesses are increasingly relying on these more systemic ways of tracking the relation between people and location-specific services, rather than on more interpersonal modes of recognizing who a "regular" is at a particular establishment. The stacks of reward and stamp cards that people find in their wallets are traces of their movement through urban space, and in turn become tracers for businesses to track customer loyalty.

Almost all participants described the difficulties they had in managing the proliferation of different reward and loyalty cards Paper-based stamp cards were present in all three cities. Electronic discount cards, used in grocery stores in all three cities and in large electronic stores in Japan are a more technically sophisticated version of paper stamp cards. By swiping a member card, the store can keep track of purchases and give a discount of points based on a percentage of purchases. The last type of reward system is credit card systems where points are banked towards airline mileage or other rewards. In the US and London, certain retailers had credit cards that were specific to their stores. In Japan, there is some experimentation with coupon and reward systems that were accessed via mobile phone. For example, certain search sites offer discount coupons or point systems that are accessed through the mobile web, through web searches or by photographing a QR code with a camera phone. We saw only a handful of instances where people tried to use these systems.

The overall proliferation of these cards in people's wallets was notable, and many, particularly in Tokyo, kept stacks of these cards at home. A typical stack in a Tokyo-ites wallet would include 5-15 point and reward cards, and double that number or more in a stack at home. In Tokyo, point and stamp cards were issued for almost every type of service and retails establishment, including bakeries, electronics shops, clothing stores, and bars. In London and Los Angeles, those numbers were fewer, and were generally restricted to grocery store and coffee cards. Most people will fairly offhanded in what prompted them to get a card. Usually it was offered by the salesperson and they decided to take it. In the US, reward credit cards are often offered at the sales counter, and they offer to take 10% off the current purchase. This can be a motivation for someone who is otherwise relatively indifferent to these schemes to pick up a new card. For example, "Joan" has credit cards for Target, Banana Republic, and Victoria's Secret because she got 10% off on the day of purchases. "It was like ten percent on whatever I bought that day if I got the card so like fine. Okay. I'll just never use it."

Participants varied in the degree of attention they paid to different reward and loyalty schemes. Individual variation was greater than regional variation; in every city we found people who worked hard to maximize the benefits of different reward schemes, and others who preferred to largely ignore them or found them too much of a hassle or a violation of privacy. Those who were attentive to these schemes tended to have a general awareness of how much they were getting from them, and knew how different rewards were calculated, but many people only had a vague idea of how the electronic systems

calculated rewards and how they were redeemed. Consider, for example, contrasting examples in London. "Susan" has 7 different point cards. She uses mostly her Sainsbury grocery card and her Boots drug store card. The others were for a grocery store she virtually never goes to, 2 coffee shops, one bakery, one video store and one massage service. Each had different point systems. Despite the relatively large number of cards she uses, however, she is not terribly attentive to the details of how the points are used. For the Sainsbury card, she uses the reward points every time she purchases, and does not realize that she can save and keep track of the points for larger rewards. For her Boots card, she doesn't know how many points she has or how she can redeem them. "You've got to use some machine or something to figure out your points. I'm not actually sure." "Judy," on the other hand, has a similar array of cards, but is somewhat more attentive to how rewards are banked and redeemed. She has figured out how to use the complicated system at Boots. "Normally, I collect points until it gets to thirty or forty pounds and then I'll buy myself a present like a hair dryer of perfume or makeup. Saving up the points until they mean something. Kind of a reward to myself then."

A handful of participants resisted in different degrees the process of footprinting through these types of reward schemes. One concern was over a bulky wallet. Many participants in Tokyo voiced concern over the expanding wallet, but everyone still carried around a relatively large array of stamp and point cards. "Cathy" in Los Angles hates carrying around different cards and prefers a minimalist wallet. She carries around stamp cards for the coffee shops she frequents because they have to exist in paper. For the grocery stores she prefers to give them her phone number rather than have to carry another card around.

Other participants had a more explicitly critical stance to the proliferation of information-based reward schemes. "Susan" in London has the most critical stance among the people we interviewed, though she still uses reward cards.

> A: I think you have to spend about a million pounds to get anything much for free. But because I buy contact lens solutions and things like that, quite expensive things, then it does gradually mount up. I kind of object to the whole idea really…So, now all those people will take your card and you get your money. You have to spend like – you have to spend a pound, and then you get two points. Once you've got five hundred points, you get two pound fifty off for shopping. I wrote that out one day. So you have to spend two hundred and fifty quid to get two quid. It's not really worth shopping.
> Q: And do you use the card? Why do you carry it?
> A: Yeah. You know Michael Moore? I went to a Michael Moore thing where he told everybody they had to cut them up because they were evil.
> Q: Oh, he did?...How are they evil?
> A: Well, because you shouldn't have loyalty toward the company. You should have loyalty towards your friends and the family and things like that. It's just a real scam to try and make you shop in the same place.

In Tokyo, Gai has a cautious stance toward different reward and customer footprinting schemes, that center around privacy concerns. He is careful not to use his credit card for

any transactions that he would not want others to know about. He's nervous about digital cash schemes that keep detailed footprint information. "It would be convenient if all cars had ETC [Electric Toll Collection] installed to begin with but I'm a little uncomfortable with the idea that it identifies the driver"

Others resisted the depersonalization of customer loyalty by engaging in alternative ways of being recognized and leaving a footprint at favorite establishments. For example, one of our female participants in our Tokyo study has a fixed "ant path" for shopping at an upscale mall. During our shadowing session with her, she describes the stores she regularly frequents, and some of the employees know her by name. Though she may have reward cards for different boutiques, she also develops a personal relationship through regular routes through the mall. The ways in which people develop relationships to "camp sites" are also evidence of a more person-centered relationship to establishments. In Tokyo, Taka makes use of the usual array of reward cards and frequents fashionable franchises like Starbucks where he uses his coffee bean card. At the same time, he also likes to develop personal relationships with people who work at the cafes and stores he frequents. While shadowing Taka we see him strike up a conversation with the woman behind the Starbucks counter. "I like to speak to the clerk when I am buying something," he explains. Among our research participants in all three cities, however, this mode of developing more personal relationships to urban services or establishments was rare. In contrast to the large number of point, reward, and transactions cards in people's wallets, people had personal relationships to very few services, and only a few individuals were known "regulars" at cafés, stores, and restaurants.

For the most part, point, stamp, and reward cards are relatively unimportant technologies for people as they go about their day-to-day life. A majority of people use them if they are not inconvenient. A minority of people actively work to maximize the benefits of these systems. Most find these systems mildly annoying and impersonal, and a few try to actively resist them in both direct and subtle ways. Although establishments see them as ways of tying customers into particular places, and developing a sense of identification, presence, and loyalty with their service, people in our study did not experience these reward schemes in this way. Although electronic footprinting has the advantage of ease of use, they have an even more depersonalizing effect on people's interfacing with urban infrastructures, and raise privacy concerns. With the move towards franchising and chain stores, reward schemes are increasingly delocalized as well as depersonalized. They automate the more messy human systems that have traditionally been in play, where shop owners and workers recognize regulars and reward them with discounts, free drinks, or coffee. Unlike the sedimentation of human relations when people are known regulars, card based footprinting seems to most often foster an effect of interchangeability unless the establishment is a local one that is used frequently in an individuals ant path. People are also resistant to leaving personal traces in locations where they do not have a personal relationship. The efforts that people make to retain a personal relationship with particular service people or local establishments is a small effort to resist this trend towards technology mediation and depersonalizing in our relationship to urban services.

Conclusions

In this paper, we have described ways in which portable information objects and devices mediate people's relationships to urban infrastructures, locations, and services in three global cities. Although there is much variability in the specifics of infrastructures and services in the different cities we have studied, there are many shared practices, activities, and trends. The basic mobile kit of phone, wallet, and keys are a constant in all three cities, as are the items in the second-order mobile kit which often include a music player and reading material. These are the basic technological building blocks for access, interfacing, and footprinting as people move about the city. One of the most striking findings of our study was the degree to which the contents of the mobile kit and related practices were similar in the three global cities. The major differences we identified were the prevalence of car-based cocoons in Los Angeles, and the greater reliance on card-based footprinting in Tokyo. In all three cities however, we saw individual-driven efforts and maximizing process of cocooning and camping, and business-driven efforts to mobilize footprinting.

The overall trend is towards increasing reliance on information-based, automated, and impersonal systems for managing relationships with urban infrastructures and services. As people carry increasingly rich and immersive media, even crowded locations such as public transportation becomes spaces of private media consumption. With the advent of digital music, mobile communications, and other forms of portable media, these cocoons are increasingly personalized and customized. A related tendency is in play for technologies that manage our access and interfacing with private and semi-private locations and infrastructures. While keys and ID cards have always been highly individualized access technologies, now transit infrastructures and communications infrastructures are also becoming more customized. Digital cash cards for microtransactions enable people to keep track of each train or bus ride, and in contrast to payphones, mobile phones are information-age technologies that enable careful tracking of each call, packet, and text message.

The trend towards automating and systematizing interactions with urban locations is perhaps most pronounced in the proliferation of different reward and point schemes, particularly digital ones attached to large chains and franchises. Although the activities of customers and staff are tracked more than ever with these new schemes, they are also highly interchangeable. It is not the personal characteristics of an individual that matter so much as their information identity, an identity that can be transferred to another by sharing point cards or member numbers. Just as cocooning and portable digital technologies reduce the frequency of serendipitous encounters with people's personal identities in public space, these automated reward and point schemes reduce the practices of personal management of customer loyalty. In other words, more and more of our articulation of personal and social relations to urban space are being delegated to different technologically embodied infrastructures, accessed with portable technologies of various kinds.

A study of the everyday, mundane activities of interfacing with urban space reveals shifts in urban experience that are low-key but pervasive, and have subtle effects in a wide range of social, cultural, and technical domains. Urbanites travel through the city carrying a broadening array of information devices and tools for manifesting their identity in public space. Our focus has been on these information devices, so in some ways our claims towards the informatting of urban experience may be overstated. At the same time, however, our research in a range of urban locations reveals a resilient set of practices and trends that are gradually entering the information age. The social outcomes of people engaging in private, mobile phone talk in public spaces is just one element in a much larger array of technosocial practices that mold public space to accommodate and trace personal identity and experience. Embedded infrastructures of location-based services are by nature slow to change, in contrast to the ease with which people have adopted personal technologies like the mobile phone or personal computer. As more and more functions of cocooning, interfacing, and footprinting become embedded in information devices that are converging with mobile phones and handheld computer, we are seeing an evolution of urban infrastructures and services with informational devices and infrastructures. In this paper, we have tried to identify the underlying social practices that drive practices of interfacing with urban locations, as well as the technological shifts that are reshaping these practices in subtle ways.

Acknowledgments

References

Cooper, L., Baber, C., & Johnson, G. (1999). *A run on sterling--personal finance on the move.* Paper presented at the ISWC, San Francisco.

Dourish, P. (2001). *Where the action is: The foundations of embodied interaction.* Cambridge: MIT Press.

Dourish, P., & Bell, G. (2007). The infrastructure of experience and the experience of infrastructure: Meaning and structure in everyday encounters with space. *Environment and Planning B: Planning and Design, 34*(3), 414-430.

Goffman, E. (1963). *Behavior in public places: Notes on the social organization of gatherings.* New York: Free Press.

Habuchi, I. (2005). Accelerating reflexivity. In M. Ito, D. Okabe & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in japanese life* (pp. 165-182). Cambridge: MIT Press.

Ito, M., & Okabe, D. (2005). Technosocial situations: Emergent structurings of mobile email use. In M. Ito, D. Okabe & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in japanese life* (pp. 257-273). Cambridge: MIT Press.

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

Kindberg, T., Spasojevic, M., Fleck, R., & Sellen, A. (2004). How and why people use camera phones. from http://www.hpl.hp.com/techreports/2004/HPL-2004-216.html

Koskinen, I. (2005). *Pervasive image capture and sharing: Methodological remarks.* Paper presented at the Pervasive Image Capture and Sharing Workshop, Ubiquitous Computing Conference, Tokyo.

Licoppe, C., & Inada, Y. (2006). Emergent uses of a multiplayer location-aware game: The interactional consequences of mediated encounters. *Mobilities Journal, 1*(1), 36-61.

Ling, R. (2002). *The social juxtaposition of mobile telephone conversations and public spaces.* Paper presented at the Conference on the Social Consequence of Mobile Telephones, Chunchon, Korea.

Ling, R. (2004). *The mobile connection: Cell phone's impact on society*. San Francisco: Morgan Kaufman.

Ling, R., & Julsrud, T. (2005). Grounded genres in multimedia messaging. In K. Nyiri (Ed.), *A sense of place: The global and the local in mobile communication* (pp. 329-338). Vienna: Passagen Verlag.

Mainwaring, S., Anderson, K., & Chang, M. (2005). *What's in your walllet: Implications for global e-wallet design.* Paper presented at the CHI, Portland, OR.

McGonigal, J. (2006). The puppet master problem: Design for real-world, mission-based gaming. In P. Harrigan & N. Wardrip-Fruin (Eds.), *Second person*. Cambridge: MIT Press.

Murtagh, G. M. (2002). Seeing the "rules": Preliminary observations of action, interaction and mobile phone use. In B. Brown, N. Green & R. Harper (Eds.), *Wireless world: Social and interactional aspects of the mobile age* (pp. 81-91). New York: Springer.

Okabe, D., & Ito, M. (2005). Keitai and public transportation. In M. Ito, D. Okabe & M. Matsuda (Eds.), *Personal, portable, pedestrian: Mobile phones in japanese life* (pp. 205-218). Cambridge: MIT.

Okabe, D., & Ito, M. (2006). Everyday contexts of camera phone use: Steps toward technosocial ethnographic frameworks. In J. Höflich & M. Hartmann (Eds.), *Mobile communication in everyday life: Ethnographic views, observations and reflections* (pp. 79-102). Berlin: Franks and Timme.

Plant, S. (2002). *On the mobile: The effects of mobile telephones on social and individual life*: Motorola.

Riviere, C. (2004, October 18-19). *Mobile camera phones: A new form of "being together" in daily interpersonal communiation.* Paper presented at the Mobile Communication and Social Change, Seoul, Korea.

Star, S. L. (1999). The ethnography of infrastructure. *American Behavioral Scientist, 43*(3), 377-391.

Van House, N., Davis, M., Ames, M., Finn, M., & Viswanathan, V. (2005). *The uses of personal networked digital imaging: An empirical study of cameraphone photos and sharing.* Paper presented at the CHI, Portland, Oregon.

Van House, N., Davis, M., Takhteyev, Y., Ames, M., & Finn, M. (2004). The social uses of personal photography: Methods for projecting future imaging applications. Retrieved December 3, 2005, from http://www.sims.berkeley.edu/~vanhouse/pubs.htm

Weilenmann, A. (2003). "i can't talk now, i'm in a fitting room": Formulating availability and location in mobile phone conversations. *Environment and Planning A, 35*(9), 1589-1605.

Wellman, B. (1999). *Networks in the global village: Life in contemporary communities*. Boulder: Westview Press.

Yoshii, H., Matsuda, M., Habuchi, C., Dobashi, S., Iwata, K., & Kin, N. (2002). *Keitai denwa riyou no shinka to sono eikyou*. Tokyo: Mobile Communications Kenkyuukai.