In mCommerce We Trust:
The Social and Trust Behaviours of mCommerce Shoppers

Serena Hillman and Carman Neustaedter

School of Interactive Arts and Technology, Simon Fraser University

250-13450 102 Ave, Surrey, British Columbia, Canada

shillman@sfu.ca, carman_neustaedter@sfu.ca

ABSTRACT

Mobile devices are increasingly being used in a variety of new contexts, including situations at home or work where one might previously have used a computer. One area in which this is increasingly occurring is mobile shopping termed mCommerce. To understand this space better, we conducted a diary and interview study with mCommerce shoppers who have already adopted the technology and shop on their mobile devices regularly. Our results describe spontaneous purchasing and routine shopping behaviours where people gravitate to their mobile device even if a computer is nearby. We also found that app marketplaces and shopping recommendations from friends offered a form of brand protection, which reduced users' feelings of distrust in companies when shopping. These findings suggest that mobile shopping applications and web services should be designed to directly leverage friend networks and known marketplaces in order to be successful.

Author Keywords
Mobile; commerce; trust; shopping.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Design; Human Factors.

INTRODUCTION
As a culture we are now seeing a large uptake of mobile devices that expand the ways in which people connect with and obtain information. While there has been a large amount of research on eCommerce there has been comparatively very little that focuses on understanding mCommerce, or mobile shopping. mCommerce is defined by Kalakota and Robinson as transactions conducted while on the move [6].

Our research focus in this space was twofold. First, we were interested in understanding the everyday routines of people who perform mCommerce activities to learn what people shop for, when they shop, and how they feel about shopping on mobile devices. Previous research has shown that mobile devices are most often used in the home, outdoors, and in transit, and, most surprisingly, more than 50% of people studied used their mobile phones to access the Internet even though they had access to a computer that was close-by [13]. We wanted to understand if and how such a phenomenon extended to mobile shopping.

Second, we wanted to focus in on the topic of trust and explore how mobility and the use of mobile devices affect issues of trust amongst shoppers. In the past, a lack of consumer trust has been cited as a major barrier to the adoption of eCommerce. A common assumption is that consumers are vulnerable and likely to expose themselves to loss if they provide personal information during an online purchase transaction [4]. Thus, one of the main focal points of eCommerce research is trust; it is one of the main factors that affect whether or not people engage in eCommerce activities and to what extent [8]. Researchers have even developed trust models to understand and address buyer concerns. We wanted to understand how such models might extend to mCommerce, if at all.

This position paper describes our research study on mCommerce and concludes with discussions of our future work in this space. Full details on this study can be found in [5].

RELATED WORK

eCommerce and Trust
People commonly shop for any and all things online, though some people are less likely to adopt online shopping behaviours than others [8]. Trust is a critical component for any transaction, but is essential in the eCommerce environment where transactions are more impersonal, anonymous and automated. Consumers sometimes feel vulnerable within these transactions—likely to expose themselves to loss if they provide personal information [4]. Lack of trust can result in an overall discouragement to take risks and continue with the transaction.

Trust is a complex term; researchers typically describe trust as being based around: predictability, reliability, fairness,

benevolence and integrity [2]. Social exchange theory shows that people make social decisions based on perceived costs and benefits, trying to maximize benefits and minimize costs [8]. For eCommerce, if the perceived risk is low enough, people will purchase products online [8]. Trust is commonly divided into two categories for commerce activities. First, *hard trust* is based around technical solutions and secure interactions with the belief that data will be transmitted and encryption and firewalls can protect customer information [4]. Second, *soft trust*— the focus of our study—is centered on the privacy of personal information and vendors' quality of service [4]. This type of trust normally cannot be resolved through the application of back-end technology such as new encryption methods, data transfer protocols, etc. [10].

There are several factors that make it difficult for online companies to develop trust with their customers as compared to in-person stores. Typically online stores are easier to quickly create; consumers are not able to view a company's investment in buildings and personnel; consumers are unable to physically evaluate products in an online environment; and, online stores often lack human elements and interaction [4].

Zucker developed three types of Trust Production Mechanisms which Luo [8] subsequently extended in eCommerce. First, *characteristic-based trust* relies on similarities between consumers and companies in order to establish trust (e.g., similar sex, ethnicity, or affiliations) [8]. Second, *Process-based trust* refers to trust that is built through a history of past transactions. Luo describes it as a form of gift-giving and sharing of information that is especially important in the business-to-business (B2B) world [8]. For example, companies often create and distribute 'white papers' to promote their company [8]. Third, *institutional-based trust* is deliberately intended to build trust in the holder's ability, integrity and intentions [2]. This is done through third party guarantors such as universities with certified education, associations with professional conduct standards, and medical and law licenses to guarantee ethical practice [2, 8].

Mobile Device Usage
Turning to mobile device usage, we see that people use mobile devices in a variety of situations and for different purposes. Using a diary and interview study, Nylander et al. [13] explored the use of mobile phones and found that they were most often used in the home (31% of the time), in addition to outdoors (23%), in transit (23%), indoors (16%), and at work (8%). Most surprisingly, more than 50% of their participants used their mobile phones to access the Internet even though they had access to a computer that was close-by [13]. Our study builds on this to understand where and when mCommerce activities occur.

Researchers have also investigated specific instances of mobile device usage that offer important comparisons for our study. Using a voicemail diary Palen et al. [15] explored the mobile phone practices of new adopters. Results showed that people normally started using mobile phones for reasons of safety, business, or to replace a landline phone; however, usage often migrated to unexpected things such as constant accessibility and micro coordination [15]. We show how a similar activity occurs for mCommerce. Using a survey and screenshot diary study, Karlson et al. [7] found it was difficult to follow-up (or continue) with uncompleted tasks at a later point, especially if this was done on a different device or computer [7]. Our study builds on this by showing that mCommerce activities do not typically migrate between devices.

The only study that we know of specifically focusing on mCommerce activities was O'Hara and Perry's [14] photo diary and interview study that looked at how users deferred impulsive shopping purchases. Their findings showed that people often needed more information about items before purchase and were unable to get this information. Thus, half of deferred transactions could be further supported by the incorporation of cross-medium information transfer strategies such as QR codes [14]. They also found that deferred transactions resulted because of the social nature of some purchases and a requirement for discussion or asking permission (e.g., asking a partner) before buying. Thus, they suggest incorporating social networks in mCommerce design.

In summary, the related work provides a backdrop for understanding trust and eCommerce activities. We also see that mobile activities have been studied in a variety of ways, but there is little specific research on mCommerce. We return to these topics in our Discussion to interpret our findings and compare our work to the related literature.

STUDY METHODOLOGY
In the summer of 2011, we conducted a diary and interview study of mobile device shopping and purchasing behaviours and routines, as well as issues of trust.

Participants
We recruited 17 adult participants (9 female) who were regular mobile device shoppers (e.g., purchased online at least once every two weeks)--we chose this population because their shopping behaviours and trust issues were less likely to be a result of new user adoption or novelty. Participants' ages ranged from 19 to 44 and occupations varied heavily. Participants also ranged in terms of their main mobile device: eight people used an iPhone, three used an iTouch, three used a Blackberry, two used an Android device, and one person used an iPad. All participants but one was from the same metropolitan city within North America.

Method
Our study method was deliberately exploratory, despite there being existing knowledge of mobile device routines, eCommerce activities, and trust frameworks. We wanted to explore mCommerce without preconceived notions of what the activity "should" entail. Our study method consisted of two distinct stages.

Electronic Diary.
We recognized that mobile device activities can take place at various times and places and it can be difficult to directly observe these activities as a result [7]. For this reason, participants first kept an electronic diary of their mCommerce activities over a period of three weeks where we asked them to fill out an online form for each of their mCommerce activities. This included both shopping (without purchasing) and buying. Participants were encouraged to take a screenshot of their mCommerce activities as they happened in order to capture an in-the-moment visual that could be later used for recollection.

Semi-Structured Interview
Following the three-week diary period, we conducted a semi-structured interview with each participant. The goal of the interview was to expand on the understanding of the activities recorded in each participant's diary, to check the accuracy of entries, and allow participants to voice any other additional insight.

In total, participants completed 161 diary entries that contained mCommerce activities. All participants had at least one activity and the average was 9.5 entries across the three-week span (median 9, range 1 to 20). We inductively analyzed all diary entries along with our interview notes using open, axial, and selective coding to draw out the main themes and compare participants.

Activities	%
Shopping (no purchase)	54
Software Downloads	26
"Real World" Items	17
Auctioning/Selling	3

Table 1. Activities across diary entries

SHOPPING & PURCHASING ACTIVITIES
Participants used their mobile devices for a large variety of mCommerce activities, as shown in Table 1. This was dominated by shopping without purchase (Row 1), followed by the acquisition of software (e.g., apps) (Row 2), the purchase of 'real world' items (Row 3), and bidding/selling items in auctions (e.g., eBay) (Row 4). Some people performed certain activities more than others, yet we did not notice any trends related to specific demographics.

For **shopping**, participants were looking for a particular item at one or more stores (on their mobile device) or comparing prices of an item. In this case, however, there was no purchase. Most shopping was done within apps created and published by specific stores (e.g., eBay, Amazon). To a much lesser extent, some participants would use their mobile device's web browser to shop on a particular company's website.

Software downloads included a large amount of 'app' downloads for the device itself using the device's marketplace (e.g., Apple App Store) (92%). Others bought a browser download, OS upgrade, and a podcast.

Participants bought a variety of **real world items** including movie or sports tickets, food, jewelry, shoes, yoga classes, flowers, ebooks, books, and clothing. A breakdown for the cost of items/services/products people shopped for is shown in Table 2.

Cost	%
Free	30
$1-$5	5
$6-$30	30
$31-$100	14.5
$101-$350	14.5
$350+	6

Table 2. Cost across diary entries

DAILY ROUTINES AND TIMING
We found that the timing of mobile shopping and purchasing fell into three broad categories. People either shopped spontaneously when the need arose, as a habit or routine, or during fixed time intervals based on schedules.

Spontaneous Mobile Shopping
Close to half of our participants (8 of 17) were highly spontaneous in their shopping habits. In these cases, participants' shopping and purchasing activities were a response to their external environment and other activities. This included triggers from activities both on and off their mobile device. For example, participants were already out shopping in person and needed to compare prices on products, they were told that new software updates were available for their device, or they completed certain activities, such as reading a book, which prompted them to shop for and download a new book to read. Because participants carried their mobile device with them nearly all the time and most had constant Internet connectivity, they were able to act on these stimuli in the moment, regardless of their location or time of day.

Shopping as a Habit or Routine

Just under half of our participants (6 out of 17) were much more routine in their shopping activities. Routines certainly varied across participants, but the fact that shopping activities occurred in a consistent and repeating pattern was somewhat surprising. That is, participants had a specific time and place where they shopped on their mobile device, they looked for a specific type of item or specific stores' items, and the behaviour repeated regularly. Shopping was either simply for the sake of having something to do, or it was because the participant had a particular interest in a certain type of item.

For some participants, the routine act of shopping was tied strongly with checking their email, which was also a routine act done at particular times in the day.

Two participants used their mobile devices to shop at eBay, Amazon, and specific interest stores for collectable items on a regular basis from their work or homes. Here they were interested in specific items as opposed to simply 'filling the time.' This illustrates the more targeted nature of some participants' shopping routines.

Shopping During Fixed Time Intervals

We also saw that while not necessarily routine, three participants had fixed time intervals when they would shop. That is, they would shop at a certain time, yet they wouldn't do this on a consistent basis and they weren't looking for specific items. These instances were also not spontaneous in nature.

For example, several participants described being at work and having a few spare minutes where they decided to shop online. Their company policy was such that they were not allowed to 'surf' certain websites so, instead, they would use their mobile phone for these shopping activities. Thus, the time interval for shopping was during the participants' work hours, but it didn't occur every workday and there was no particular spontaneous trigger for the activity. It was simply out of a desire to shop.

Another participant would similarly shop in the evening when she was at home after work. This too wasn't a recurring routine, but her shopping always occurred at this time and place when it did happen.

CHARACTERIZING TRUST (AND MISTRUST)

Overall, participants had few trust concerns when shopping and making transactions on their mobile devices. This was surprising given the concerns people often have for eCommerce. We explore the reasons for this next.

Product and Store Brands

'Brand' played the most significant role in trust for mCommerce. By brand we are referring to the actual company that participants engaged with to shop or make purchases (e.g., the eBay app, the Macy's web page). Participants continually stressed their trust in these brands either as a marketplace app or the actual vendor. Only one participant recorded diary entries, which, excluding price comparison activity had no past experience with the vendor. In cases where participants had negative feelings towards a brand, the company's app was never downloaded to the person's mobile device. Participants simply knew the companies before they would shop at their stores (via the store's app) on their mobile device.

Brand Transfer via the 'App' Approval Process

In addition to trust in store and product brands themselves, participants mentally transferred their trust from larger companies (e.g., Apple) that approved mCommerce applications to the applications themselves. That is, app marketplaces were highly successful in transferring trust from their well-known brands—Android App Market, Amazon's marketplace, Apple's iTunes, and the Apple App Store—to their affiliates and partners.

For example, many participants said that apps found in the Apple store were trustworthy because, as consumers, they felt they were protected by the Apple brand and the 'pre-screening' that the company does before permitting an app to be present in the store.

Recommendations from Friends or Family

We also found that participants had few trust concerns because many of their shopping or purchasing activities were based on recommendations by close friends or family. For example, 9 of the 17 participants engaged in mCommerce activities that were initiated by a friend or family member's recommendation, either in person or via an electronic medium (e.g., email). Within these nine, four even engaged in a mCommerce activity directly through a social media platform (e.g., Twitter, Facebook).

Because of the social influence of others, interactions with particular vendors or products were deemed to be trustworthy, regardless of whether they actually were or not in fact. The sheer act of social recommendation elevated companies, brands, or items to a trustworthy status.

Mistrust

In some cases, mistrust did arise but this was rare. Across all 161 diary entries, only 11 entries indicated there was a trust issue. Four diary entries discussed a lack of trust in the purchasing of a mobile device app because the app had a low rating as recommended by other users. In total, four diary entries related to mistrust because of brand. Two diary entries by the same participant reflected instances where he simply did not trust a brand because of a lack of recent history with it. Two diary entries related to *security concerns, e.g., encryption.*

In addition to the above, participants cited usability issues (1 entry) and the limited ability to physically evaluate a product (1 entry) as reasons to mistrust mCommerce activities.

Even though the frequency of the above occurrences is small, it further suggests the importance of the aforementioned reasons why people have few trust concerns for their mCommerce activities.

CONCLUSION
Our position paper has explored the shopping and purchasing behaviours of users on their mobile devices through a diary and interview study. Here we found that mobile commerce activities are a ubiquitous activity that occurs in many places, including home, work, and on transit. For some this spontaneous, and for others it was either part of a routine or during fixed time intervals. In relation to trust, many people had few concerns and this can be attributed to several factors that map at a high level to trust mechanisms established for eCommerce. That is, most of the trust mechanisms/factors that we saw for mCommerce could be translated in some form to those established for eCommerce. However, in each case, mCommerce brought unique nuances in terms of how the trust mechanisms were being applied and thought about by users.

Our results suggest that because purchases were made on a mobile device, unlike personal computers, they tended to be made from companies which either already had a strong relationship with users from previous mobile transactions, those done in other mediums, or because of a strong referral by friends (or at the very least a referral in a social space). Our findings suggest that the more mCommerce applications tie to existing friend networks or established and known brands, the more likely people will trust them (for good or bad).

Perhaps the most fascinating difference between eCommerce and mCommerce activities and notions of trust was the heavy use of application stores and 'apps' designed by specific companies. The regular use of these applications is non-existent within the eCommerce literature. Of course, we are now beginning to see companies migrate many strategies from mCommerce to the eCommerce domain where computer-based shopping and purchasing can be performed in app marketplaces just like on mobile devices. For example, the Apple App Store can now be used on a Mac computer for buying software (e.g., programs, games). This suggests that commerce activities in the future will further blend between eCommerce and mCommerce.

Together, our study suggests value in designing experiences for mobile devices or web services that leverage people's existing social networks and the companies in which they are already comfortable and trust. We hope to be able to explore this idea more as a part of the workshop.

FUTURE WORK
Future work we are currently working on will develop the central domains and factors outlined in this study [5] from a number of different approaches.

First, we will be investigating a "successful" implementation of mobile commerce using recent African developments as a study subject.

In 2011, using feature phones--not smartphones—Africans demonstrated a higher preference to shop through a mobile device then through either desktop computers or in-stores [3]. Items purchased varied from clothes to electronics to event tickets [3]. In comparison, mobile commerce accounted for only 2% of all web sales in the US [1]. With these results, it's surprising that we still know very little about African mobile shopper's behaviours and the social dynamics behind these actions. Understanding the 'what' and 'why' behind this phenomenon can allow mobile practitioners or researchers from developed nations to learn by seeing mobile commerce from a new perspective.

This study will investigate the social dynamics, routines and behaviours of users who participate in mobile commerce in Kenya. This new perspective, suggests a successful way to integrate mobile commerce in everyday life with limited technology. Our findings will allow us to understand how to better design sites and/or understand the African mobile shopping experience in order to support mCommerce activities and needs in more developed nations.

In addition to mobile commerce, other new forms of shopping are also emerging. Secondly, we aim to explore another new commerce activity Group Shopping sites – taking a similar approach to [5] and investigating the social dynamics of friendship networks of those who participate in group shopping sites.

The emergence of group shopping sites has significantly impacted the socio and cultural landscape, resulting in sites such as Groupon, LivingSocial, Plum District and Half Off Depot to become a key commerce trend over the last couple of years. These sites entice consumers with wholesale prices for the eCommerce realm by leveraging group purchasing power. Groupon Inc, the largest online coupon company [1] grew by 223% percent in 2010 and generated more than $700 million in revenue [1] with a presence in more than 150 markets in North America and more than 100 markets in Europe, Asia and South America [9].

While these sites are quickly becoming large players within the eCommerce sphere, we still know very little about their user's behaviours and social dynamics. Without knowing what people do, we cannot properly design the sites to support their activities and needs.

In both future works we will specifically be looking at single social situations to discover the cultural knowledge people are using to organize their behaviour and interpret their experience. As we progress along the study both questions and answers will emerge to further inform future studies to develop variables and meaning.

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BIOGRAPHIES

Serena Hillman is a PhD student in the School of Interactive Arts and Technology at Simon Fraser University, Canada. She has been working in eCommerce since 2003 at several web design and development firms across North America. She studies the characteristics of user's perceived trust concerns related to everyday routines and social behaviors while participating in mobile shopping and mobile commerce. http://drinkthecoolaid.com

Carman Neustaedter is an Assistant Professor in the School of Interactive Arts + Technology at Simon Fraser University, Canada. His research is in design, human-computer interaction, and domestic computing. Here he focuses on the design and use of technologies for connecting people who are separated by distance or time. This includes design for promoting family connectedness, support for workplace collaboration, and bringing people together through pervasive games. To learn more about his research group, the Connections Lab, visit http://clab.iat.sfu.ca