Social Issues, Behaviours and Routines of Ubi-Commerce Users in North America

by

Serena Hillman

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Bachelor of Arts, Quinnipiac University, 2003

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Name: **Serena Hillman**

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Examining Committee: **Chair:** Firstname Surname
Position

Firstname Surname
Senior Supervisor
Assistant/Associate/Professor _____

Firstname Surname
Supervisor
Assistant/Associate/Professor _____

Firstname Surname
Supervisor
Assistant/Associate/Professor _____

Firstname Surname
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Abstract

eCommerce has dramatically changed over the last several years, leaving a gap of knowledge around what these changes mean to—and how they affect—the user and their experiences. To address this gap, I collected empirical evidence through three studies. The first looks at mobile web commerce, and focuses heavily on the issue of trust. The second looks at group shopping sites, an example of social commerce. The third study investigates mobile payment systems and user challenges and successes. Although each study introduces specific design implications, together they expand extant work in traditional eCommerce to include social and mobile aspects and thus contribute new knowledge toward a more ubiquitous commerce (ubi-commerce) experience.

I define ubi-commerce as specifically dependent on the recent mass adoption of mobile devices, social engagement online, and new technologies for payment processing. I discuss these ubiquitous forms of commerce as a North American entity only and thus the design implications are meant to be specific only to this region.

My original contribution to knowledge consists of new knowledge and description of ubi-commerce user behaviours; six ubi-commerce design implications, derived from empirical evidence gathered from a variety of studies described in this dissertation; and methodological contributions, by applying existing research methods to new situations and contexts.

Keywords: mobile commerce, social commerce, electronic commerce, mobile payment systems, ubi-commerce, behaviours

Dedication

For my love, Alexandra Chuba; without your optimism, patience and support, I would not have been able to complete this once-in-a-lifetime opportunity; the best part: completing the journey with you. <3

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Thank you to my mom and dad, who have supported and loved me over the last 32 years, for which I am truly grateful. Also thank you to my brother who has always been my side-kick through this world. You are an inspirational artist who has continued to inspire all of my creative and adventurous ideas. I would also like to mention my appreciation to my employer Mario Livich, through whom I have learned so much from during these past eight years. Your support of my studies has allowed me to pursue what I truly love, and for that I am forever grateful. Finally to my Grandma, who made this moment possible with her persistent belief in me that I can achieve anything. I miss you.

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List of Acronyms

HCI	human–computer interaction
MPS	mobile payment systems
NFC	near-field communication
QR	quick response
SMS	short-message service

Publications

Materials, ideas, and figures from this dissertation have appeared previously in the following publications.

Hillman, S., Neustaedter, C., Oduor, E., & Pang, C. (2014). Mobile payment systems in North America: user challenges & successes. *Extended Proceedings of the Conference on Computer-Human Interaction*. New York, NY: Association for Computing Machinery.

Hillman, S., & Neustaedter, C. (2014). In mCommerce we trust: The social and trust behaviours of mcommerce shoppers. *Proceedings of the Workshop on Financial Interactions, Digital Cash, Capital Exchange and Mobile Money (#CHIMoney) at the ACM SIGCHI Conference on Human Factors in Computing Systems*. New York, NY: Association for Computing Machinery.

Hillman, S., Neustaedter, C., Pang, C., & Oduor, E. (2013). "Shared joy is double joy": The social practices of user networks within group shopping sites. *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems* (pp. 2417–2426). New York, NY: Association for Computing Machinery.

Hillman, S., & Neustaedter, C. (2012). Trust in mobile shopping: An empirical study. *User Experience Magazine, 11*(4). November, 2012. doi:10.1145/2212776.2223716

Hillman, S., & Neustaedter, C. (2012). In mCommerce we trust: The social and trust behaviours of mcommerce shoppers. *Proceedings of the Workshop on Mobility and Web Behaviour at Mobile HCI*. New York, NY: Association for Computing Machinery.

Hillman, S., Neustaedter, C., & Bowes, J. (2012). The routines and social behaviours of frequent mcommerce shoppers. *Extended Proceedings of the Conference on Computer-Human Interaction* (pp. 1841–1846), New York, NY: Conference on Human Interactions. doi:10.1145/2371574.2371593

Hillman, S., Neustaedter, C., Bowes, J., & Antle, A. (2012). Soft trust and mcommerce shopping behaviours. *Proceedings of the ACM SIGCHI Conference on Human-Computer Interaction with Mobile Devices and Services* (pp. 113–122). New York, NY: Association for Computing Machinery.

Chapter 1.

Introduction

Over the last several years, eCommerce has been rapidly transforming in response to the adoption of mobile and social technologies. Specifically, I draw attention to the expanding adoption of social-networking sites and mobile-phone market penetration as prime triggers to this development. This expansion has brought about a new form of commerce, ubi-commerce, that leverages the mass adoption of mobility for real-time access to information, resources, and tools for the purpose of shopping or purchasing goods or services, that before was only available in a stationary environment. Ubi-commerce, comprised of social commerce (sCommerce), mobile commerce (mCommerce), and mobile payment systems (MPS), has begun to impact not only developed nations' economies (e.g., Canada, United States, and Europe), but also developing nations' economies around the world (e.g., Kenya and India).

Some of these forms of ubi-commerce are on the verge of becoming key dominating players in the eCommerce sphere—and some already are; yet, little is known about their users and how or if their needs are being supported. This dissertation presents three studies that explore ubi-commerce practices to identify users' social behaviours, activities, and routines in North America. The overarching goal of this dissertation is to create empirically supported design suggestions to understand if ubi-commerce systems have advantages over the more traditional forms of eCommerce. This chapter briefly outlines what comprises ubi-commerce, an overview of the studies conducted, the research questions, problems, and objectives, and finally, an outline of subsequent chapters in this dissertation.

1.1. Research Context

This dissertation focuses on understanding user behaviours, routines, and social issues in ubi-commerce, a subset of electronic commerce. This dissertation touches on two areas in the eCommerce field: traditional eCommerce and ubi-commerce. *Figure 1.* eCommerce

illustrates the two areas of eCommerce and their relationship. These two areas are also further defined and compared in *Figure 2*, where I introduce the current relationship between the two as a continuum.

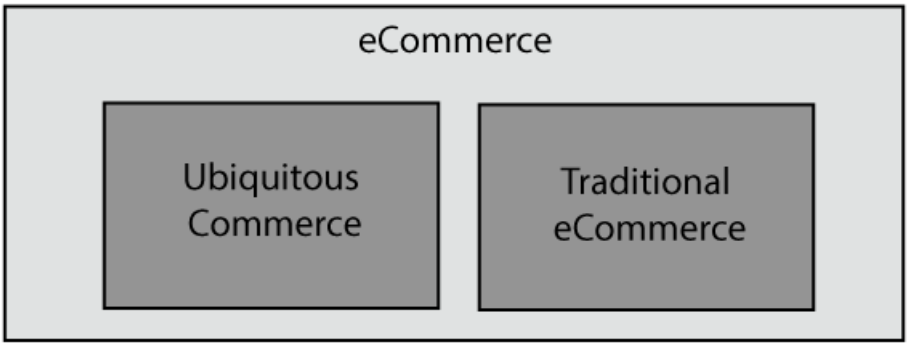

Figure 1. **eCommerce**

Ubi-commerce extends beyond traditional electronic commerce by leveraging synchronous activities (context) and using social data (e.g., electronic via social networking sites), allowing for greater integration into user's daily lives. Watson (2000) first introduced a vision of ubi-commerce, by presenting it through four main features:

1. ubiquitous: connecting anytime, anywhere, with integration into most devices;
2. uniqueness: personalization through user needs, location, and context;
3. universal: multifunctional and always on; and
4. unison: synchronizing data across services to provide required information, no matter the location of device

As diagrammed in *Figure 2*, the space of traditional eCommerce and ubi-commerce, in its current state, is a continuum, instead of a two distinct methods. This presented continuum follows Watson's (2000) ideals that ubi-commerce experience has a tendency to be more contextual, complex, and embedded in an ongoing relationship with the user compared to traditional eCommerce. For example, buying a book through Amazon on a stationary computer tends to be a more traditional eCommerce experience. This activity is largely detached from social and contextual implications because the purchase is made in isolation from others. It also has a generally straight forward objective (buying a product) and this is a detached relationship from one's social circles. Although a user might buy numerous books from Amazon, the

commerce or shopping activity is not embedded and ongoing in the sense that the system does not support this activity through design solutions such as a silo application (app) environment, rewards and gamification, curation through social media, or impression management tools (concepts described and articulated in detail as part of the research in this dissertation). If for instance, the user purchases the book over Amazon using a mobile device, the experience would fall on the ubi-commerce side of the continuum as it would open the user up to more social and contextual implications. Social implications are the roles and status of users and their behaviour in society; with ubi-commerce this includes such factors as social perception and impression management as the user is put into social situations either virtually (e.g., social-media interactions) or physically (e.g., in-store person-to-person interactions). Contextual implications in ubi-commerce generally stem from the mobility dimension, as users' environment and interaction with that environment can be quite complex. This interaction could depend on factors such as location (e.g., a work environment), multitasking opportunities (e.g., driving and shopping), and changing environments (e.g., commuting to work: waiting for a bus, getting on bus, and being on bus).

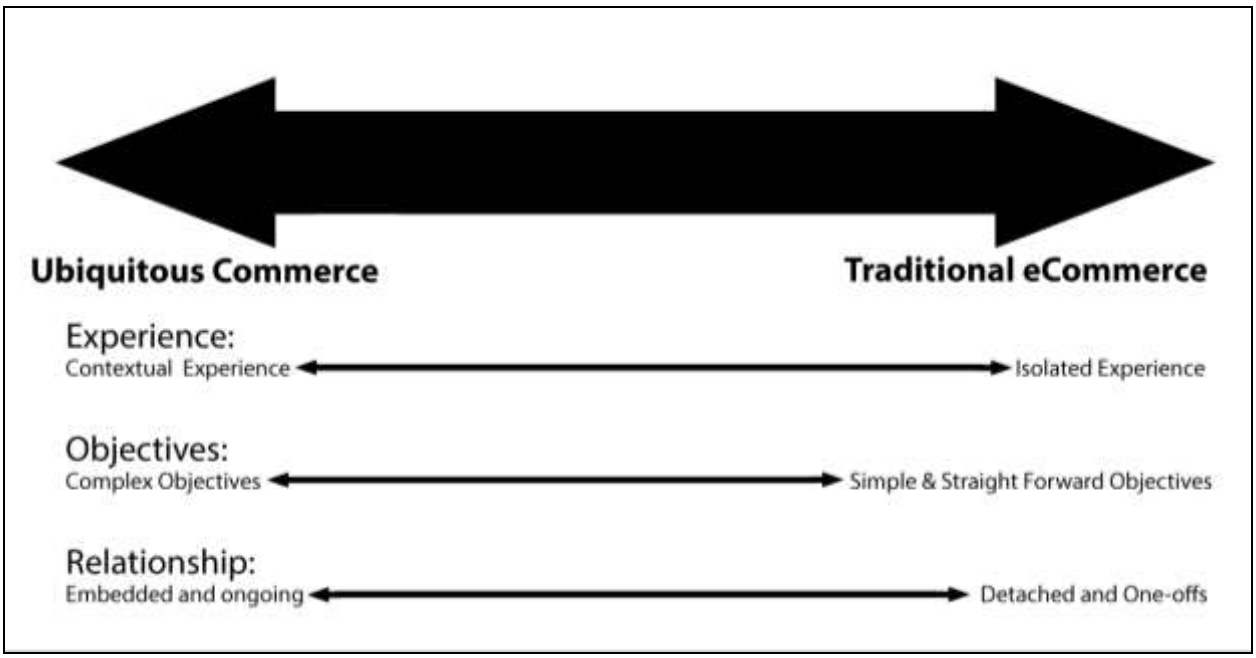

Figure 2. **The ubiquitous/traditional eCommerce continuum.**

This space might evolve into more of evolutionary model where traditional commerce becomes superseded by ubi-commerce, but will depend on user expectation over time, as traditional commerce might still serve a purpose to the user.

Over the past ten years we have seen online shopping, or eCommerce, become an integral component of the developed world's economic landscape, globally opening channels between business and consumer. However this arena is continually changing. Specifically, over the past five years, with the introduction of smartphones and through the socialization of the web across all ages (see Figure 3), eCommerce is yet again reinventing what it means to shop online. Figure 4 illustrates the dramatic growth of smartphone users in the United States, reaching over 100 million in 2012. Figure 3 shows the number of times Americans access their social networks daily and the growth of this phenomenon by over 500% in the last five years. No longer is eCommerce only a stationary act with simple linear relationships executed by "customers" and "vendors" for the sole purpose of obtaining a service or product. Instead, mobile and social has provided users with access to commerce that transcends traditional notions of eCommerce; this is primarily accomplished through portable and highly personalized services, which are limitations of stationary computers.

This dissertation focuses on understanding the users of ubi-commerce by sampling three major forms of the phenomenon, mobile commerce (mCommerce), social commerce (sCommerce) and mobile payment services (MPS). I include shopping in the context of ubi-commerce, as it is a key precursor to the event.

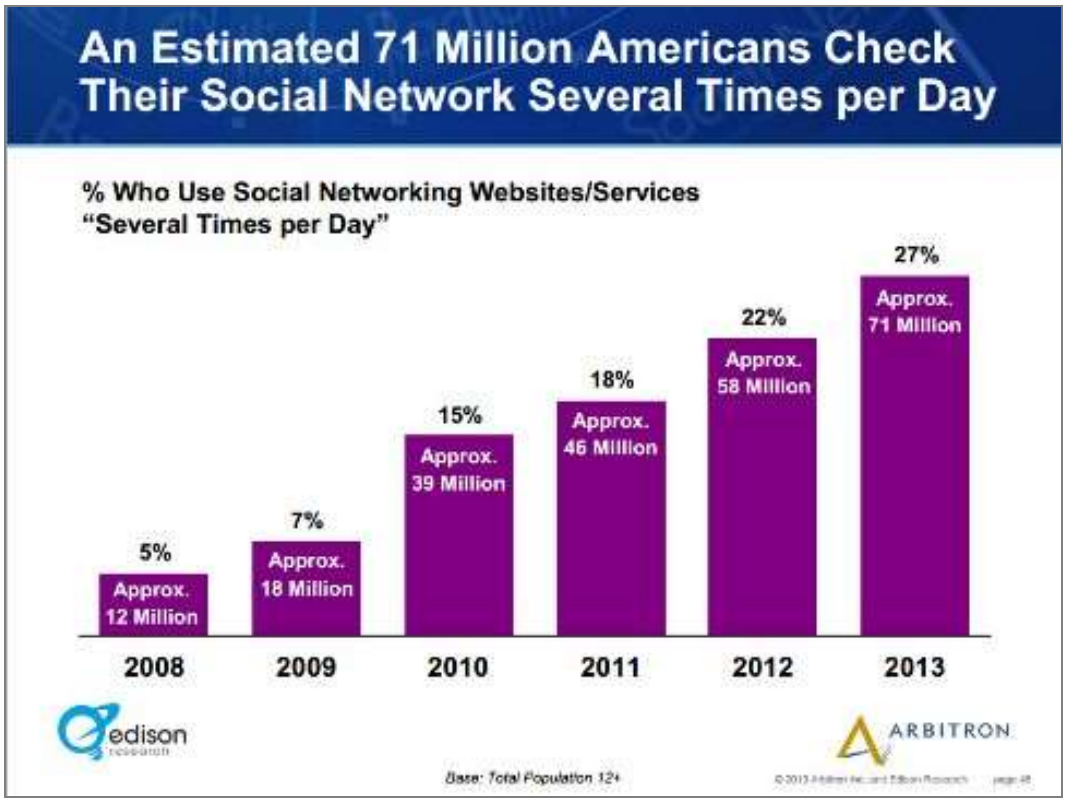

Figure 3. **Social media use in the United States**

Note. **Source: Edison Research, 2013.**

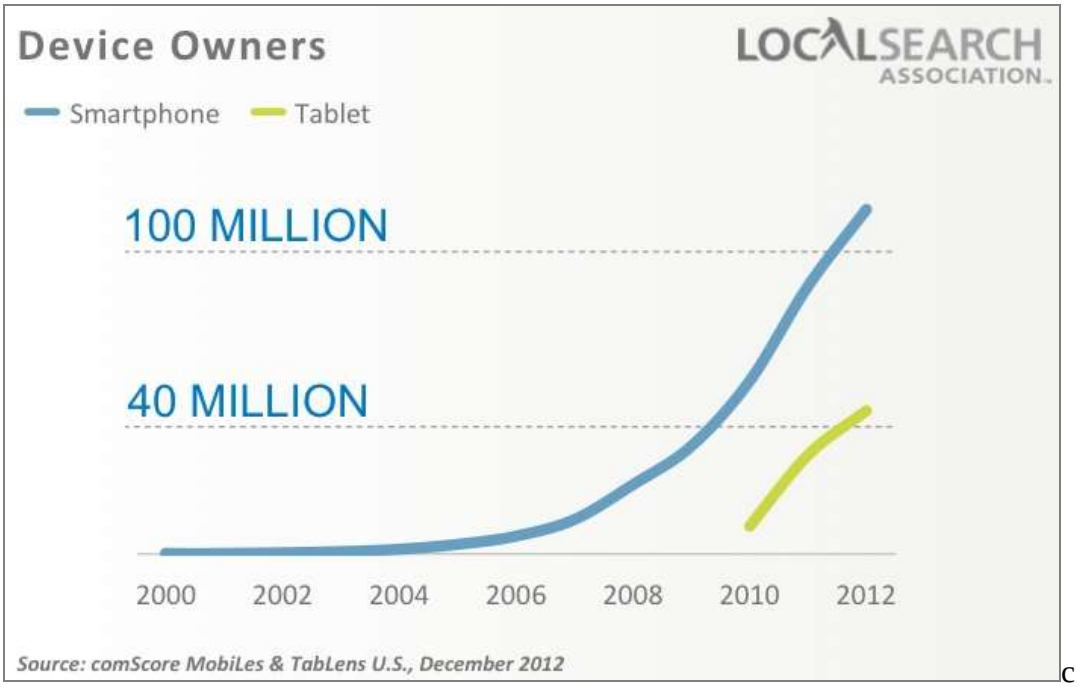

Figure 4. **Growth of Smartphone devices in the United States.**

Source: Local Search Association, 2012)

Table 1 *Examples of Ubi-Commerce* illustrates examples of ubi-commerce application types in areas around the world. Column 1 lists the type of commerce system, Column 2 shows the type of countries in the world where it has been established, Column 3 shows the platform for the type of commerce, and Column 4 shows the year it was first introduced to the public for use. For example in Row 1 Facebook commerce, or fCommerce, is an example of social commerce, where users of the social network Facebook can buy or sell goods. This includes purchasing items from Facebook games (for example, Farmville). Users can browse products, add products to their carts, and make transactional purchases, all while staying on Facebook (see Figure 5). This particular type of ubi-commerce is mostly present in developed nations and can be used through a mobile device or a stationary computer.

Another example of ubi-commerce are Mobile Payment Systems (MPS). Table 1 shows a number of different mobile payment systems that transact through carrier billing, near-field communication (NFC), apps, or card readers. These mobile payment systems range from highly

successful forms with high adoption, such as M-Pesa, to services such as Google Wallet that are struggling to get noticed in a competitive and low-adoption environment.

Table 1

Examples of Ubi-Commerce

Application	Commerce type	Location	Platforms	Year est.
Mobile Browser	mCommerce	Developed Nations	Mobile	Range
App Marketplaces	mCommerce	Developed Nations	Mobile	Range
In-App	mCommerce	Developed Nations	Mobile	Range
Facebook	sCommerce (fCommerce)	Developed Nations	Mobile/PC	2012
Google Wallet	MPS	USA	Mobile	2011
Starbucks	MPS	North America	Mobile	2011
Levelup	MPS	USA	Mobile	2011
Pinterest	sCommerce	Developed Nations	PC/Mobile	2010
Airtel Money	MPS	India	Mobile	2009
MTN Mobile Money	MPS	South Africa	Mobile	2009
Square	MPS	USA	Mobile	2009
Groupon	sCommerce	Developed Nations	Mobile/PC	2008
Amazon Payments	MPS	Developed Nations	Mobile	2007
M-Pesa	MPS	Kenya	Mobile	2007
Etsy	sCommerce	Developed Nations	PC/Mobile	2005

Note. MPS = mobile payment system; QR = quick response.

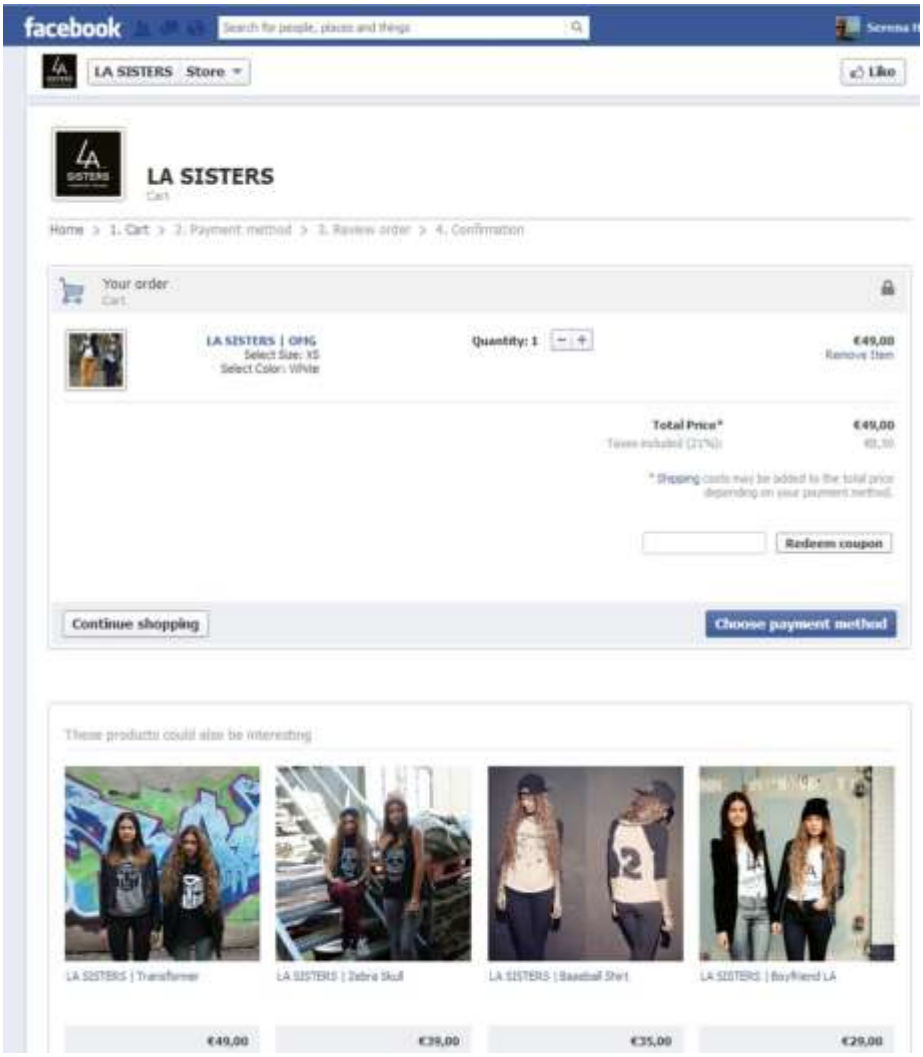

Figure 5. **Example of fCommerce shopping experience.**

A number of the North American ubi-commerce services will be described in detail throughout the dissertation, providing ample descriptions of ubi-commerce. I now review background information on each space that is the focus of this dissertation focuses: mobile commerce, social commerce, and mobile payment.

1.1.1. Mobile Commerce

In 2011, more smartphones were sold globally than personal computers (Gartner, 2012). Within the next five years, smartphones are projected to dwarf PC sales at around three times the amount (Gartner, 2012). This increase in mobile connectivity and mobile adoption is giving more and more users the ability to connect *anytime, anywhere*. This has provided a natural gateway to the introduction and development of a variety of mCommerce services. In 2011,

comScore reported that 38% of consumers have used smartphones to buy products or services (comScore, 2011). No longer do users have to be confined to their stationary desktop computers to access the vast amount of tools and information found online. With the introduction of mobility and reachability, a variety of new services can be introduced allowing for greater integration into users' everyday lives (Liang & Wei, 2004). This *anytime, anywhere* aspect of mobile commerce is a mainstay of past research in the area as it is a clear move from traditional commerce, which is historically stationary.

With eCommerce continually adapting to this ever-changing landscape, practitioners and researchers alike must review significant factors that have been essential in the success of eCommerce and apply them to current trends. One such factor is trust. Trust has been a major obstacle for the success of eCommerce (e.g., Egger, 2000, 2001; Keen, 1999; Luo, 2002; McKnight, Choudhury, & Kacmar, 2002). At the most basic of levels, a common assumption is that users are vulnerable and likely to expose themselves to loss if they provide personal information during an online purchase (Head & Hassanein, 2002). Thus, the level of trust established within the user/vendor relationship dictates if a transaction will occur and, moreover, to what extent (Keen, 1999; Luo, 2002). Not only does trust play a key role in the adoption of new technologies and the initial trust with a new vendor, but trust results in repeat purchases and continued relationships (Head & Hassanein, 2002). In order to illustrate relationships and characteristics of trust within the eCommerce sphere, researchers have developed trust models. Understanding trust in electronic commerce is essential to laying a foundation for comprehending how trust will continue to evolve. Despite this research, there is still not a detailed understanding of how mCommerce users shop and what trust concerns people have while shopping using a mobile device.

1.1.2. Social Commerce

In addition to mobile commerce, other new forms of shopping are also emerging. Smartphones, tablets, consults and smartTVs have allowed users to be online more frequently and for longer durations of time (Koetsier, 2012). This lengthening of time online is especially true for social networks, which have increased in popularity in 2012 at a staggering 90% (85.5 million users July 2012; 44.8 million users July 2011). The socialization of the web through influential sites such as Facebook, Twitter, and Pinterest, are changing views and expectations of web entities and their role in socialization and collaboration, whether or not the user's goal is consumer based.

Like mobile adoption, the emergence of group shopping sites has significantly impacted the sociocultural landscape, resulting in sites such as Groupon, LivingSocial, Plum District, and Half-Off Depot becoming key commerce sites over the last couple of years. These sites entice consumers with lower prices by leveraging group-purchasing power. Groupon Inc., the largest online coupon company, saw revenue grow by 223% in 2010 and generated more than $700 million in revenue with a presence in more than 150 markets in North America and more than 100 markets in Europe, Asia, and South America (Barr, 2011). Past research has looked at users and their behaviours and routines on social networking sites but not as a commercial application, where the primary purpose of their activity is shopping.

The first-known use of social commerce originated in 2005 and was coined by Yahoo's David Beach. He wrote about the concept on the Yahoo!'s search blog. The post centered around the release of the of the Shoposphere and Pick Lists Beta, which he defined as social commerce (Beach, 2005); these two applications allowed users to share products by viewing (within the Shoposphere) other shopper's "product streams" (pick lists) (Beach, 2005). His definition asserts the consumer is not the seller of the product or service but a social component *to* the selling process. Beach's definition will be used for this dissertation as it focuses more on social relationships than the point of purchase or commerce engine in use. Further, it represents the social changes that have transpired online in the last couple of years, specifically the mass adoption of social media and the socialization of the web.

1.1.3. Mobile Payment Systems

Using mobile phones as a system of payment is burgeoning as vast numbers of users in developed and developing nations have or are beginning to accept these services. Mobile payment is defined as "all payments for goods, services and bills authorized, initiated or realized" on a mobile device (Ondrus & Pigneur, 2006). The majority of successful mobile payment systems currently use one or more of the following four payment solutions: carrier billing, NFC, apps, and card readers. For example, Figure 6 shows the M-Pesa interface, a carrier billing solution, where users transfer money through short-message service (SMS). M-Pesa transfers are often completed through text messages and have specific success in unbanked areas as well as the gaming industry. NFC solutions (e.g., Google Wallet) take place at the point of sale, where the phone is waved in front of a terminal. Figure 7 shows the Google Wallet application being scanned by NFC to make a payment. App solutions such as the Starbucks Gift Card app usually involve a barcode on a smartphone app being scanned at the

register. Figure 8 shows the Starbucks app interface before, during, and after purchase. Card readers, like Square, use the current credit system but include a swiping hardware component as an add-on for smartphones. Figure 9 shows a Square card reader plugged into an iPhone and a Visa card being swiped for payment.

Figure 6. **M-Pesa interface (SMS money transfer system).**

Figure 7. **Google Wallet, near field communication.**

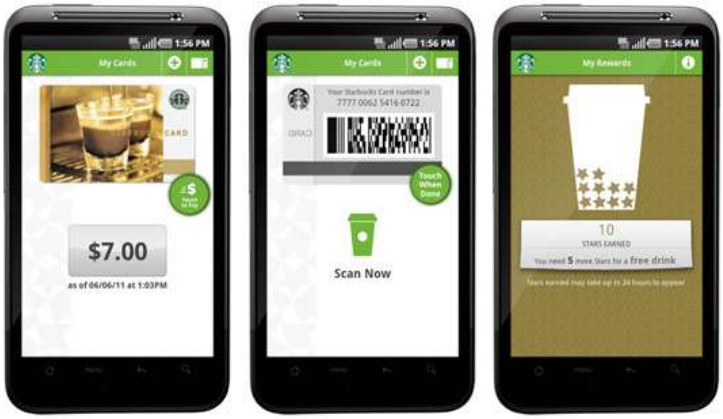

Figure 8. **Starbucks app (barcode scan).**

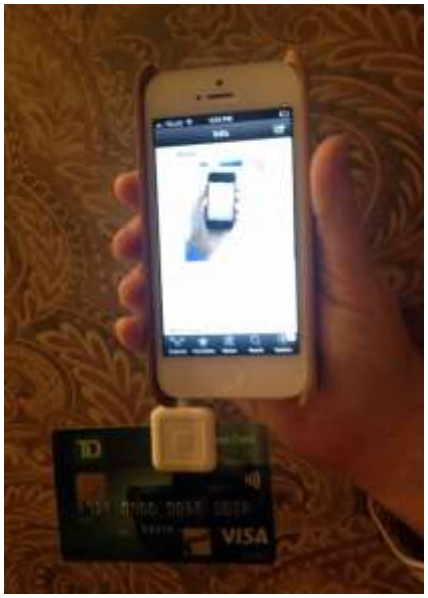

Figure 9. **Square payment system (card reader).**

For the first time in eCommerce history, the addition of mobility has allowed the involvement of developing nations to extensively use these new forms of computer-mediated commerce. North America has not been able to reach the success of other countries in the adoption of mobile money-transfer services. In 2011, using feature phones—not smartphones—Kenyans demonstrated a higher preference to pay through a mobile device than through either desktop computers or in stores by using the mobile transfer system, M-Pesa.

Originally developed as a microfinancing platform, M-Pesa was introduced in 2007 by Safaricom, the largest mobile network operator in Kenya. The service was quickly adopted by users for a variety of mobile-transfer alternatives that are now the main functionality of the service. Because only one in five Kenyans have a bank account, an important component to M-

Pesa adoption has been the acceptance of new applicants based only on national personal identification cards or passports (Okechukwu, 2012). This design allowed the company not to be regulated as a financial organization), which requires a far more stringent review process than that used for telecommunication companies (Okechukwu, 2012). Also aiding in its adoption, Safaricom's mobile-network operator market share was estimated at 70% at the time of M-Pesa's launch when 60% of the Kenyan population owned a mobile device (Okechukwu, 2012). This gave M-Pesa access to enough potential users and ensured an economically viable solution (Okechukwu, 2012). Further, Safaricom's brand recognition aided in the initial trust for mass adoption of M-Pesa (Okechukwu, 2012). Currently the company reports over fifteen million users and a 50% adoption rate in the country. Items purchased through the system vary from clothes to electronics to event tickets. In comparison, mobile commerce in North America accounted for only 2% of all web sales in the United States (Barr, 2011). This is further illustrated in Figure 10, which shows the projected disproportionate growth of mobile payment in North America versus the world.

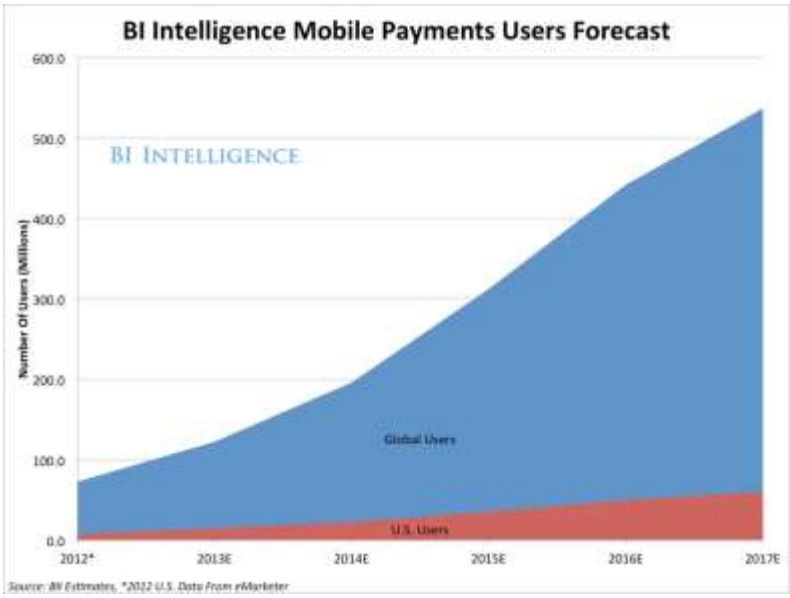

Figure 10. **Estimated American growth of mobile payment vs. global.**

China has also found success with Alipay, a third-party online-payment platform with currently over 650 million registered accounts as of the end of 2011. Through these examples and others, successful mobile money transfer is not only possible, but is a reality in a variety of social contexts.

The recent expansion of mobile commerce has also caused existing online payment and money-transfer systems such as PayPal to expand their services and include mobile payment

systems in North America. In general, these services seek to leverage the ease-of-use associated with a universal payment system that has proven to be invaluable to a mobile user. Further, large online players such as Google and Amazon have entered the space with Google Wallet and Amazon Payments, respectively. Google Wallet's aggressive and well-publicized service aims to not only provide money transfer for online and mobile, but retail as well, using a number of the different payment solutions mentioned above.

Because mobile payment is a newly emerging ubi-commerce activity, my research will explore how users are adopting these services, what social issues exist, and why. However, unlike mobile commerce and social commerce, mobile payment are just gaining strength in North America.

1.2. Research Questions and Objectives

Ubi-commerce is at a time of significant growth and adoption. As a developing phenomenon little is known about user behaviours and social issues of these new types of commerce and how to design for them. This dissertation will present the findings derived from three exploratory studies that focus on user issues in social commerce, mobile commerce, and mobile payment, three major components of ubi-commerce.

Overarching Research Question. *What routines and social behaviours hinder or promote ubi-commerce?*

By identifying these behaviours and routines, user requirements can be generated that will be helpful in informing user designs in the future. Overall, the main objective of this dissertation is to *create knowledge and a foundation of understanding around key ubi-commerce routines and behaviours in the hopes of informing future designs* (Overarching Research Objective). This goal is achieved through three exploratory studies reported in this dissertation and the synthesis of these studies into six design considerations. The overarching research question is further partitioned into the following questions and objectives:

Research Question 1. *What user routines and social behaviours exist for mCommerce and how do users mitigate trust?*

A variety of studies on eCommerce have considered trust, but few have considered trust in mCommerce and none have considered trust with mCommerce in recent years. It is unknown how users gain trust, and socially, what routines and other social behaviours impact mCommerce activity from a user's perspective. Thus, *the first objective is to gain insight into mCommerce user's routines and social behaviours to further inform design* (Research Objective 1).

To address this objective, I conducted a study looking at users' behaviours and routines around mobile commerce shopping. Further, I specifically focused on understanding users' trust behaviours, as trust has traditionally been a main staple in eCommerce and commerce relations (Head & Hassanein, 2002; Luo, 2002; McKnight et al., 2002). Users reported mobile commerce activities via an electronic diary; at the end of three weeks they participated in an in-depth interview.

Research Question 2. *What user routines and social behaviours exist for group shopping and how well do group-shopping sites support them?*

As illustrated earlier in this chapter, group-shopping sites—a form of social commerce—have had a major impact on eCommerce over the last few years. Academic studies have largely focused on eCommerce and the individual, whether this is through online web pages (Dholakia, Bagozzi, & Pearo, 2004; Head & Hassanein, 2002; Rohm & Swaminathan, 2004) or mobile apps or browsers (Nylander, Lundquist, & Andreas, 2009; O'Hara & Perry, 2001; Tossell, Rahmati, Shepard, & Zhong, 2012). Understanding how users shop online in groups and how well group-shopping sites support their practices have not yet been explored. *The second objective is to explore group social shopping online, and gain an understanding around how users interact with one another, how groups of shoppers are created, and what motivates users to shop in groups* (Research Objective 2). As Internet users overwhelmingly adopt social-networking sites, understanding social behaviours and motives is a key component of ubi-commerce.

To address this, I conducted a study that explored this literature gap by focusing on users who participate in a form of social commerce (sCommerce), group-shopping sites, to better understand users' shopping networks, motivations, and routines. This study is discussed in detail in Chapters 5 and 6.

Research Question 3: *How are users participating in mobile payment in North America on smartphones and what are the user challenges and successes?*

The third research question considers the ubi-commerce area of mobile payment. The recent penetration of smartphones in North America is accompanied by identity-enacted services (Liang & Wei, 2004). Many people agree that the future of commerce will be highly influenced by these services that allow users to make payments through smartphones and feature phones. As mentioned in the previous section, the potential for these services has recently been supported with online players such as Google and Amazon, aggressively entering the space with Google Wallet and Amazon Payments. Research Question 3 explores how these services aim to change how users make payments online and in retail situations. Although a number of studies have looked at mobile payment in developing countries (e.g., Hinman & Matovu, 2010), and developed countries in Europe (Mallat, 2007; Ondrus & Pigneur, 2006) and Asia (e.g., Kim, Mirusmonov, & Lee, 2010), this body of work has not focused on the North American market and smartphones. *The third research objective is to investigate mobile payment users' practices, motivations, how they mitigate trust and their successes and challenges within the mobile payment space* (Research Objective 3).

To address Research Objective 3, I conducted a study focused on understanding how existing and new mobile payment users participate in mobile payment in North America on smartphones to understand how to design mobile payment systems to increase user experience. This study is discussed in detail in Chapters 7 and 8.

Research Question 4: *What design considerations can be established through the triangulation of empirically collected knowledge around ubi-commerce users' routines and behaviours to inform better design and improve user experience?*

The final research question synthesizes empirically gathered data from the three studies presented in this dissertation. In conjunction, the final objective seeks to *create empirically based ubi-commerce design considerations by triangulating similarities from the three studies presented in this dissertation.* These considerations and the triangulation of the studies are presented in detail in Chapter 9.

This research is important because I believe that we are in a global state of change around how we pay for and shop for goods and services. This specifically involves shopping becoming more integrated into our non-shopping lives, as well as less of a separate activity.

Payments and shopping are primed to change in the near future, which would suggest to include such new concepts as e-Wallets, possibly part of new wearable technologies such as smart watches, or even possibly through finger print recognition. This work contributes to the eCommerce research area by informing current designers how to design so users will not fear this technology; rather, how to build trust, a positive user experience, as well and respecting the privacy of the user.

1.3. Methodology

A variety of methods are used to conduct research in the field of human–computer interaction (HCI); all have a place in evaluating how users interact with systems. This section outlines the methods selected to explore the research questions outlined above, primarily focused on gathering data of users while they are mobile, because of the focus on mobility in ubi-commerce. Here I also provide a short history of what methods have typically been used for past research on commerce. My research was exploratory in nature, given the relative "newness" of the three aspects of commerce. Thus, the data collected was primarily qualitative. Because this work is exploratory, the use of induction, rather than deduction, was used to infer knowledge claims.

Of the exploratory HCI studies on participants who are mobile, the majority have used combinations of diary entries or semi structured interviews. Studies often stress the importance of capturing users' experiences while the event is still on their minds (Brandt, Weiss, & Klemmer, 2007; Carter & Mankoff, 2005; Schmidt-Belz, 2003; Sohn, Li, & Hollan, 2008). The follow-up semi structured interview provided researchers the ability to gain clarity on any entries, if needed. Some past HCI studies on mobile use focused on collecting quantitative data to answer confirmatory research questions. Results from these studies often answered the questions researchers asked, however scholars lacked understanding of why the results occurred (Eze, Ten, & Poong, 2011; Ling, Yttri, Anderson, & Diduca, 2003). As a result, the studies in this dissertation were qualitative.

Another proven research method used to explore social components in this dissertation is the diagramming of a "mind map." Here users are asked to reflect on their social space by drawing a map showing the relationships of other users with whom they interact (see *Figure 22* and *Figure 23*). Researchers use mind maps to explore awareness and social sharing

(Neustaedter, Elliot, & Greenberg, 2006; Tee, Brush, & Inkpen, 2009). Mind maps were used as one method in the sCommerce study. The method allowed users to visually show their sharing relationships. Completed before the semi structured interview, these maps allowed users to talk freely about their "sharing relationships," similar to their use in past studies (Neustaedter et al., 2006; Strauss & Corbin, 1998).

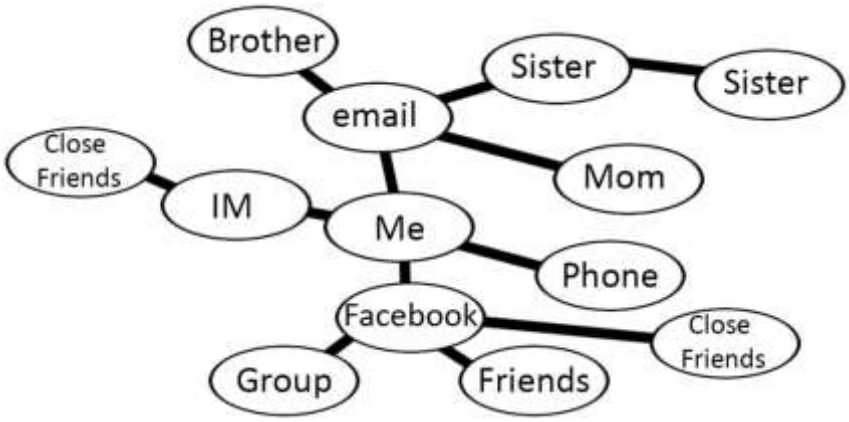

Figure 11. **Example of a mind map (digitally reproduced).**

The qualitative data collected from the semi structured interviews, mind maps, and diary entries, were coded and analyzed by domain and repeated text data (Schensul, Schensul, & LeCompte, 1999). By conducting open coding—the process of uncovering, naming, and developing concepts to open text and expose participants' thoughts (Strauss & Corbin, 1998)—patterns were discovered, then categorized and subcategorized. Axial and selective coding was then used to reassemble the data into statements about relationships, creating hypotheses (Strauss & Corbin, 1998).

To summarize, as the research questions were exploratory in nature, qualitative methods were used in the studies. Because variables and theory base are unknown due to limited extant research, a qualitative approach fits best with the exploratory nature of the research questions. I expand on these methods in subsequent chapters.

1.4. Dissertation Organization

This dissertation is presented in ten chapters. Chapter 1 introduces the research questions, general methodology rationale, and research objectives. Chapter 2 reviews the

critical points of past research conducted on topics related to this dissertation. Chapters 3 and 4 present a study reporting on the behaviours and routines of mobile-commerce users. Chapters 5 and 6 present a study on group shopping, or social commerce. Chapters 7 and 8 present the study on mobile payment. In Chapters 9 and 10 I discuss the design implications of the three studies and present a set of design considerations for improved ubi-commerce user experience. These chapters also provide insight into the advantages of ubi- commerce.

Chapter 1: Introduction

Review of dissertation context, research questions, methodology, research steps/stages and research objective.

Chapter 2: Literature Review

Outline of current research conducted on ubi-commerce and related topics such as eCommerce, trust, social networking, impression management, and awareness and sharing.

Chapter 3: mCommerce Study Methodology

Detailed account of the methodology used for the study focused on exploring mCommerce routines and behaviours. This chapter includes both rationale and description.

Chapter 4: mCommerce Routines, Behaviours and Trust

A complete description of Study 1, along with findings and discussion points.

Chapter 5: sCommerce Study Methodology

Detailed account of the methodology used for the study focusing on exploring group shopping sites routines and behaviours. This chapter includes both rationale and description.

Chapter 6: sCommerce Practices and Motivations

A complete description of Study 2, along with findings and discussion points.

Chapter 7: Mobile Payment Study Methodology

Detailed account of the methodology used for the study focusing on exploring routines and behaviours of mobile-payment systems users. This chapter includes both rationale and description.

Chapter 8: User Routines of Mobile Payment Users

A complete description of Study 3, along with findings and discussion points.

Chapter 9: Design Considerations

This chapter presents six design considerations for ubi-commerce, based on the three studies presented.

Chapter 10: Conclusions

This chapter concludes the dissertation with an overall reflection on the dissertation's objectives and contributions.

Chapter 2. Related Work

eCommerce has experienced a dramatic period of growth over the last two decades. Specifically, over the last five years, with the introduction of smartphones and the socialization of the web, eCommerce is yet again reinventing what it means to shop online. The goal of this chapter is to understand the central domains and the overarching ubi-commerce phenomenon, as well as to provide background for the studies contained in this dissertation. The chapter summarizes the literature review in three parts. The first part introduces eCommerce and trust frameworks, the second reviews mCommerce and mobile payment, and the third situates ubi-commerce in other research, including factors such as awareness, social sharing, mobile usage, and usability.

2.1. History of eCommerce and Trust

Online shopping, or eCommerce, has existed nearly as long as the Internet. People commonly shop for many things online, though some people are less likely to adopt online shopping behaviours than others. With the introduction of technology as a mediator of commerce, new risks were introduced accompanied by a need to understand the new business environment. This understanding was particularly needed for trustworthiness, as early researchers concluded “trust, more than technology, drives the growth of eCommerce in all its forms” (Gefen, 2000).

Trust is a complex concept. Because the consumer has to predict how the vendor will react in a specific situation, and this is dependent on the complexity of human interaction itself (Gefen, 2000). Keen (1999) provided an understanding of the history of trust, touching on its origins in business, political science, sociology, psychology, medicine philosophy, law, and economics. HCI often borrows from the business definition, which typically describes trust as being based on predictability, reliability, fairness, benevolence, and integrity (Gefen, 2000; McKnight et al., 2002).

2.1.1. Trust in 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 (Head & Hassanein, 2002). Thus, one of the main focal points of eCommerce research is trust. ,Trust is one of the main factors that affect whether people will engage in eCommerce activities, and moreover, to what extent (Keen 1999; Luo 2002).

Head and Hassanein (2002) divide trust into two areas—*hard* and *soft*—and differentiate between them in eCommerce. Hard trust is based on technical solutions and secure interactions with the belief that although data will be transmitted, encryption and firewalls will protect customer information (Head & Hassanein, 2002). In contrast, soft trust is centered on the privacy of personal information and vendors' quality of service (Head & Hassanein, 2002). Soft trust cannot normally be resolved through the application of back-end technology alone, such as new encryption methods or data transfer protocols (Luo 2002), because it is based more on feelings of perceived trust.

Head and Hassanein (2002) reviewed the factors that make it difficult for online companies to develop trust, compared to in-person stores. First, online stores have lower barriers of entrance and exit compared to bricks and mortar stores. This means that consumers may not trust them to stay around for long periods of time. Second, consumers are not able to view a company's investment in buildings and personnel, which could further establish feelings of longevity. Third, consumers are unable to physically evaluate products in an online environment to the same extent that they can in an in-person store. Fourth, online stores often lack human elements and interaction, providing less of a chance that "trading partners" know each other (Head & Hassanein, 2002).

In 1986, Zucker developed three types of trust-production mechanisms based on sociological and economic analysis of historical data from 1840 through to 1920. Luo (2002) subsequently extended these mechanisms to describe three ways trust can be encouraged in eCommerce. First, *characteristic-based trust* relies on similarities between consumers and companies to establish trust (e.g., similar sex, ethnicity, or affiliations). Similar characteristics build similar cultural values, which in turn create the idea of shared moral and ethical habits in line with a member's social group (Zucker, 1986).

Second, *process-based trust* refers to trust built through a history of past transactions (Zucker, 1986). This type of trust builds on reputation and therefore is dependent on customer satisfaction (Luo, 2002). Luo (2002) described process-based trust as a form of gift giving and sharing of information that is especially important in the business-to-business world (e.g., through white papers; Luo, 2002).

Third, *institutional-based trust* is deliberately intended to build trust in the holder's ability, integrity, and intentions (Zucker, 1986). 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 (Luo, 2002; Zucker, 1986). McKnight et al. (2002) elaborated on institutional-based trust by dividing it into two components: *structural insurance,* which encompasses the belief that structures such as regulations, promises, and legal resources are properly in place, and *situational normalcy,* which is the belief that the company is operating in a normal fashion.

Markedly, how people go about trusting online purchasing is a cost–benefit relationship; that is, if the perceived risk is low enough, people will purchase products online (Luo, 2002). Keen (1999) described risk as a natural accompaniment to trust, emphasizing that accompanying increased system networks comes a higher risk of infiltration of these systems. For Keen, eCommerce is a delicate "web of trust": if any strand breaks, the entire web is compromised. Familiarity is also an important precondition for trust in eCommerce and trust is a prerequisite of social behaviours (Gefen, 2000). As risk increases, the importance of familiarity for trust also increases (Gefen, 2000).

Research has shown that initial eCommerce trust is developed through reputation, site quality, and structural assurance (Egger, 2000; McKnight et al., 2002). Trust in eCommerce research is often partitioned into two main stages: initial and direct experience (Egger, 2000; Gefen, 2000; Keen, 1999; McKnight et al., 2002). Egger's model of eCommerce trust describes a trust process starting with preinteractional filters (e.g., user psychology, prepurchase knowledge, and transference); then interfaces properties and information content, and finally relationship management. McKnight et al. (2002) and Gefen (2000) described *trusting intentions* as the willingness of a consumer to engage in trusted transactions with a company, especially during the initial trust-development phase. Gefen (2000) named this concept, *disposition to trust,* defined as a "general, i.e. not situation specific, inclination to display faith in humanity and

to adopt a trusting stance toward other… this is the result of ongoing lifelong experiences and socialization".

These beliefs about establishing trust online were challenged by Riegelsberger, Sasse, and McCarthy's (2005) framework of trust for research and design. Research in eCommerce (e.g., Egger, 2000, 2001) often focused too much on symbols of trust (e.g., trust seals and uniforms) instead of symptoms (e.g., positive or numerous customer reviews, site professionalism, and site usability), which are harder to mimic by untrustworthy individuals and provide a more reliable indication of trust. Symptoms of trust are free to trustworthy vendors, but are costly to untrustworthy vendors. Examples could include that trust will not just come about as users accept a new technology and this belief can cause damage to technologies and services, as trust is an "integral part of human interaction" (Riegelsberger et al., 2005) because it fosters simplicity that, in turn, reduces the cost of commerce.

eCommerce has changed dramatically over the last five years with the increased use of mobile devices, such as smartphones and tablets, as well as social applications. This creates potentially new issues for trust. Next I review some past work done in the area of mobile commerce.

2.2. New Phenomenon - Mobile Commerce

2.2.1. mCommerce

The increase of mobile device adoption among users has provided people the ability to have online connections at any time. Correspondingly, the transition to introduce mCommerce services was a natural step. mCommerce has and will continue to change the commerce landscape. mCommerce represents transactions conducted while one is mobile (Kalakota & Robinson, 2001) on a mobile device. The structural change to mobility allows for real-time access to the same information, resources, previously only available from a stationary desktop computer (Kalakota & Robinson, 2001). This portability allows greater integration into users' everyday lives. The importance of being able to access the Internet anywhere at any time is the cornerstone of much of previous mCommerce research. An example of this is Liang and Wei (2004), who described services that use location, users' identities, real-time solutions for time-sensitive issues, business processing, or increased work productivity (Liang & Wei, 2004).

In past research, the question of which mobility can best be of benefit is often the starting point to understanding which users are ideal mCommerce consumers (Anckar & D'Incau, 2002; Kalakota & Robinson, 2001; Liang & Wei, 2004). Kalakota and Robinson's (2001) book described the demographics of users who are currently shaping the mobile economy: travelers, teenagers, and the workforce. For them, the mobile user who would gain most are businesswomen who often have to juggle home and work. Although they identify this type of user, other demographic groups will certainly emerge as mCommerce continues to evolve.

Kalakota and Robinson (2001) believed that customers want continuous connection, increased speed of service, simplicity, and convenience. They urge companies entering the space to focus on their users' pains and to use the new space to create customer value, stressing that a mobile solution should fit the five R's: right content, to the right person, at the right time, at the right place, on the right device. Added value to the consumer was also highlighted in Anckar and D'Incau's (2002) results.

This idea of different mobile users having different needs and connecting in different ways is echoed in work by Liang and Wei (2004). They discussed the successful mCommerce applications i-Mode and Octopus, clarifying that it is how the technology was used and the exact context in which it was used that has made them successful. From these examples they proposed the fit-viability framework, which considers fit and viability. *Fit* is assessed by looking at the mobile technology used and the task at hand, as well as the fit between the mobile application and its users (Liang & Wei, 2004). *Viability* is assessed through the economic environment, social infrastructure, and readiness of the organization (Liang & Wei, 2004). The economic assessment is based on ensuring the service is cost beneficial to the user and the vendor. An organizational assessment would primarily focus on users' willingness and ability to use the technology. The societal aspect focuses on the "maturity of the general environment", which could include acceptance of the mobile device, and cultural acceptance.

Along with understanding the specific needs of the user, researchers agree that a very integrated and multichannel approach is needed for successful mobile commerce, especially for successful adoption to new technology in mobile commerce (Anckar & D'Incau, 2002). Researchers studied why transaction impulses on mobile phones are deferred (O'Hara & Perry, 2001). To clarify, they were looking to understand why users would put off making a mobile purchase for a later time. Their findings suggested that half of deferred transactions could be

further supported by cross-medium information-transfer strategies such as quick-response (QR) codes (O'Hara & Perry, 2001). The researchers noted that the main reason deferred reactions occurred was because of the social nature of some purchases and a requirement for discussion or asking permission (e.g., asking a partner) before buying (O'Hara & Perry, 2001).

There are noted shortcomings when comparing mobile commerce growth to its expectations (Anckar & D'Incau, 2002; Eze, Ten, & Poong, 2011; Ventakesh, Ramesh, & Massey, 2003). Lack of adaption has been blamed on poor usability (Ventakesh et al., 2003), social and cultural ideologies (Ling et al., 2003), and mobile-technology limitations (Kalakota & Robinson, 2001). These concepts are elaborated later in this literature review in the mCommerce Trust section.

Ventakesh et al. (2003) conducted a study to understand what is important to users from a usability point of view, to create an mCommerce experience that is successful. When compared with shopping on a PC, they found that relevance, ease of use, made for the medium, and personalization were important for mCommerce. They also found that a good web presence does not indicate a good mobile presence. Overall their concept is that mobile users have different goals than PC users, often related to time or location pressures.

Ancker and D'Incau (2002) concluded that eCommerce users are not eCommerce nonadapters; this debunks the theory that mobile commerce is an untapped market. The researchers stressed that eCommerce users do not use mobile commerce as a substitute but as a supplement. This further supports the idea that multimedium efforts are ideal in the mobile-commerce environment.

2.2.2. Mobile Payment

Mobile Payment have been classified as a subset of mCommerce and a form of eCommerce (Ondrus & Pigneur, 2006). Various definitions of mobile payment may include all mobile communication devices (Zmijewska & Lawrence, 2006) or, more focused, only payments on mobile phones (Henkel, 2002). In this dissertation, I adopt the later definition, similar to that of Schierz, Schilke, and Wirtz (2010) but with a focus on just mobile phones, defining mobile payment as "all payments for goods, services and bills authorized, initiated or realized" (Ondrus & Pigneur, 2006) with a mobile phone. Although seemingly valuable, there have been noted shortcomings when comparing mobile commerce growth to its expectations (Ventakesh et al.,

2003). Lack of adoption has been blamed on poor usability (Ventakesh et al., 2003), social and cultural ideologies (Kindberg, Sellen, & Geelhoed, 2004), and mobile technology limitations (Kalakota & Robinson, 2001).

Although there been no studies on mobile payment usage in North America with current smartphone technologies, there are some studies that focused on earlier versions of mobile payment in industrialized countries in Europe. First, Schierz et al. (2010) tested mobile payment use in Germany based on the technology-adoption model. This model explains that the adoption of technologies is based on the perceived usefulness and perceived ease of use of the technology (Cho, Kwon, & Lee, 2007; Davis, 1989). The Schierz et al. (2010) findings showed that perceived ease of use, compatibility, security, and usefulness, along with individual mobility positively affected users' attitudes to use mobile payment. Second, and the closest mobile payment study to my own in its findings, Mallat (2007) explored mobile payment usage in Finland more than ten years ago when mobile payment was based solely on SMS (direct billing) technology. Mallat stressed the importance of understanding adoption for mobile payment by using the diffusion-of-innovation theory. Diffusion of innovation is based on five characteristics that affect adoption (e.g., Teo & Pok, 2003). The authors identified three of these constructs for the study: relative advantage (what is the advantage over other systems) complexity (what is the ease of adoption), and compatibility with the users' daily lives. Results showed that users found mobile payment faster and more convenient than cash; mobile payments were most compatible with small-value payments; and complexities around the use of the systems along with a lack of large merchant acceptance were barriers to adoption (Mallat, 2007). Users also described issues with trust where they had feelings of "vagueness" and "perceived lack of control". Users were also concerned about trust in network reliability and having their phone accessed if it was hacked, lost, or stolen (Mallat, 2007). Although valuable, this study focused on feature phones, not smartphones, from ten years ago. Technology and culture have radically changed in this time period.

Mobile payment has also been studied in nonindustrialized countries. Hinman and Matovu (2010) investigated opportunities and challenges around mobile-based finances in rural Uganda. Their study found that users had a strong affinity to fixed assets, lacked access to capital, did not understand how mobile payment worked, and generally were confused by the mental model used to interact with the service (Hinman & Matovu, 2010). Unlike in developed nations, Ugandans lacked the reference point of transferring funds: "the movement of money from one person to another," creating a "conceptual gap" (Hinman & Matovu, 2010).

2.2.3. mCommerce Trust

mCommerce has its own technical infrastructure, new business model, and value chain (Min, Ji, & Qu, 2008). It creates new values for users and requires a new way of thinking around trust and adoption (Min et al., 2008). There have been very few studies in the area of mCommerce trust. The studies that do exist cover small portions of mCommerce. As mCommerce continues to grow, more research needs to be conducted on users and their behaviours as it relates to trust.

Siau and Shen (2003) attempted to frame a possible trust-development cycle for mCommerce. They believed soft and hard trust are equally important in the medium and discussed how initial trust and continuous trust could work in the mobile space. Their diagram (see Figure 12.) divides trust into two stages and two sections. The two stages are initial trust and continuous trust development; the two sections are the mobile vendor and mobile technology.

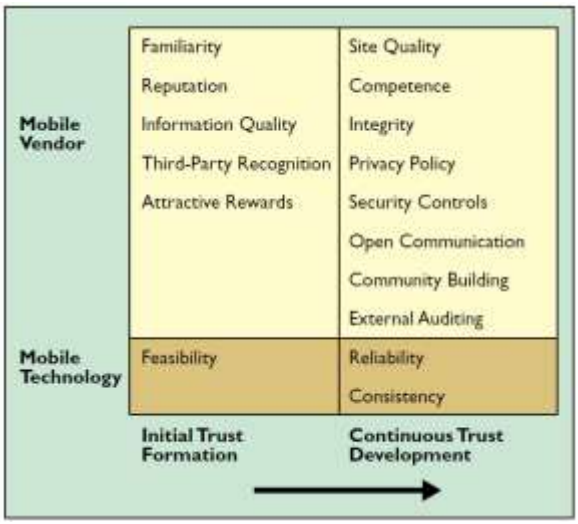

Figure 12. **Framework for Building Customer Trust in mCommerce**

Note. **Source: Development of a Framework for Trust in Mobile Commerce, by K. Siau, H. Sheng, & F. Nah, 2003, *Proceedings of the Second Annual Workshop on HCI Research in MIS*, New York, NY: Association for Computer Machinery**

As illustrated in Figure 12 in the top left quadrant, Siau, Sheng, and Nah (2003) believed familiarity, reputation information, information quality, third-party recognition, and attractive rewards will help build trust. In the bottom left quadrant, they suggested that feasibility is enough to establish trust. In the top right quadrant, they suggested site quality, competence, integrity,

privacy policy, security controls, open communication, community building, and external auditing gain trust. Finally, in the bottom right quadrant, they suggested a focus on reliability and consistency. The trust mechanics Siau et al. (2003) presented, although important, mimic trust ideologies developed in eCommerce and do not explore the new medium with a fresh set of eyes or preconceived notions of what the activity “should” entail.

Research conducted by Cho et al. (2007) considered some specific trust mechanisms and compared their effectiveness to aiding in trust and acceptance, as defined under the technology-acceptance model, with the two factors perceived usefulness (PU) and perceived ease of use. When the researchers explored trust they focused on vendor’s integrity, benevolence, ability, and predictability.

The results showed that for eCommerce and mCommerce users, trust increases a user’s intent to use. Further, trust will positively affect perceived use in eCommerce but not mCommerce. They also found that familiarity with a trustworthy e-vendor does not increase trust in either eCommerce or mCommerce; however, familiarity increases a user’s perceived ease of use, which in turn, positively affects both eCommerce and mCommerce. The quantitative study results are less descriptive about why this is the case, as they are confirmatory in nature. Similarly, Eze et al. (2011) looked at Malaysian mobile-commerce usage. They were successful in proving personal innovation, subjection to norms, perceived cost, perceived trust, perceived ease of use, and perceived usefulness all positively affected intention to use, which in turn positively affects perceived usefulness. Out of all variables, perceived cost and subjective norms were top influencers; however, the researchers provide no insight as it why some variables ranked higher than others.

Kindberg et al. (2004) conducted a controlled laboratory experiment in which users were asked to rank, compare, contrast, and answer security questions based on five configurations of mobile payment. Generally, when ranking the systems, users justified choosing one system over the other by focusing on either a combination of or solely based on social convention, trust, or convenience. Users with social-convention reasoning felt some methods of payment eliminated the visibility of paying and thought others in the store might think they did not pay, and this made them uneasy. Some users also noted they enjoyed human contact; however they trusted the system to take proper payment over the human interaction. Users focused on convenience reported they liked bypassing the need for a human to respond. Unfamiliarity of the

new payment system bred distrust, but the tangibility of having a payment device in sight increased trust (Kindberg et al., 2004).

Historically researchers have seen a negative attitude toward users engaging in mobile activities (Anckar & D'Incau, 2002; Eze et al., 2011; Ventakesh et al., 2003) especially while in social situations (Kindberg et al., 2004; Ling & Svanaes, 2011). However, as new technology becomes accepted, social conventions will follow. mCommerce is not a silo from mobile activity; it is influenced by many other factors that aid in adoption and use. Understanding these concepts and how users currently engage in mobile activities is important when evaluating mCommerce. The World Wide Web was a social phenomenon; it was not the result of new technology (Dix, Findlay, Abowd, & Beale, 1998). In the next section of this literature review I explore past work done in the areas of mobile usage, awareness, and social sharing. These topics provide additional framing for studies of new trends in ubi-commerce.

2.3. Other Factors Affecting Ubi-Commerce

Ubi-commerce is affected by other factors such as mobile usage in general, social networking sites, and awareness and social sharing. This section discusses relevant related work from each.

2.3.1. Mobile Usage

Traditionally eCommerce has been viewed as a stationary activity performed on desktop computers in offices, homes, or other locations. However, the focus on mobility in mCommerce changes this view, as people use mobile devices in a variety of situations and for different purposes (Kamavar, Keller, Patel, & Xu, 2009; Nylander et al., 2009; Schmiedl, Seidl, & Temper, 2009; Sohn et al., 2008). Using a diary and interview study, Nylander et al. (2009) 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 (Nylander et al., 2009). Reasons ranged from convenience to laziness, to preferring to use a mobile phone over a computer (Nylander et al., 2009). They also found that Internet usage on mobile phones was for

situated or general searching (30% of the time), reading news (20%), passing time (19%), checking e-mail (17%), and performing mCommerce transactions (6%).

Sohn et al. (2008) also considered for what tasks people use their mobile phones, as well as their needs while mobile and how they are currently addressed: 72% of participants indicated that information needs were prompted by a contextual factor they were unable to address 55% of the time. Kamavar et al. (2009) came to a similar conclusion when they observed that there were more mobile search queries than on a computer. They felt that more queries were by session because users were interested in their current situation but had no urgency and would not deeply explore their query in real time. This they related to Jones, Jain, Buchanan, and Marsden's (2003) "laid back" approach. Kamavar et al. indicated, "this approach implies that users enter queries because they are of interest to their current situation, but have no urgency in iterating or deeply exploring their query in real time". From the results, Sohn et al. (2008) suggested that designers need to consider users' current task, as well as the context of the activity, time, location, and conversations, to provide information as they need it at the "right time". They also suggest that mobile systems need better integration to access personal and public data simultaneously.

O'Hara, Mitchell, and Vorbau (2007) explored the consumption of video on mobile devices and found people would watch videos in and outside the home. This is, again, despite having computers or televisions nearby (O'Hara et al., 2007). People also watched video on their mobile devices at routine times during their day (e.g., while in transit) and would even turn shared spaces (e.g., a carpool) into a more private place by watching video in a solitary manner (O'Hara et al., 2007). This is similar to mCommerce because users shop while in public places on private devices as well.

Researchers have investigated specific instances of mobile-device usage. Using a voicemail diary, Palen, Salzman, and Youngs (2000) 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 unsuspecting actions such as constant accessibility and microcoordination (Palen et al., 2000). Together this showed that mobile phones are very much social devices (Palen et al., 2000). The studies furthered this idea by showing how trust in mobile shopping is socially influenced. Later in this chapter I review the area of social sharing and awareness in detail.

When looking at mobile usage it is important to identify the new challenges when compared to desktop computers. Designing for users who are mobile brings challenges such as unfamiliar environments that change and communicating through smaller devices (Dunlop & Brewster, 2002). Smaller devices require different designs for efficiency, proven by the Schmiedl et al. (2009) study which revealed that mobile sites allowed users to be 30–40% faster than nonmobile-tailored sites.

Another challenge is designing for a widespread audience; the audience can lack training and often lack the ability to provide maintenance to their phones. Limited input/output facilities are a notable challenge, as keyboard size, voice recognition, and size of screen vary heavily from the desktop. The Schmiedl et al. (2009) study on mobile-phone web browsing also reported that users liked touch phones better, unless they needed to enter data, in which case hardware with keyboards showed large advantages (Schmiedl et al., 2009).

Challenges around mobile users and multitasking are at levels significantly greater than that for most desktop users (Dunlop & Brewster, 2002). Understanding the impact this level has on task interruption is necessary to develop efficient and effective mobile experiences (Dunlop & Brewster, 2002). Over the past ten years, studies in this area have been well developed (Dunlop & Brewster, 2002); one notable example is the Karlson et al. (2010) study. Using a survey and "screenshot" diary study, they explored how users migrate between smartphones and computers when completing workplace tasks. Results showed e-mail activities, reviewing calendar appointments, and making phone calls to be the most common mobile activities with their participants (Karlson et al., 2010). They also found it often difficult to follow-up (or continue) with uncompleted tasks at a later point, especially if this is done on a different device or computer (Karlson et al., 2010). This difficulty could be the case for commerce activities as well.

Perhaps the most polarizing debate in the industry in the mobile space is the browser versus apps discussion. Ling and Svanæs (2011) argued that mobile apps are better suited for input when compared to the "PC-based browser metaphor". Traditionally the browser-based model has supported whim- and intuition-based browsing, whereas the app supports direct or powerful interactions (Ling & Svanæs, 2011). Because mobile browsing is varied more than the PC in nature—screen size, forms of input, screen resolution navigational tools—mobile web also focuses on different tasks (Ling & Svanæs, 2011). Researchers argued that mobile websites are not the solution, as browsers are designed for mobile-phone navigation (Ling & Svanæs, 2011). One of the latest studies on mobile web use of smartphones reported that apps

were used twice as much as sites, and were used more “actively,” whereas browsers were used more as discovery mechanisms (Tossell et al., 2012). The researchers described apps as “new and improved bookmarks” (Tossell et al., 2012) and users generally fit into two categories—natives and pioneers. Natives were described as using their mobile phones actively for utilitarian and hedonic reasons. Pioneers are more habitual, as they are often in the same location when they access the Internet.

The use of apps is often described as a paradigm shift, as it changes the way one uses the Internet. This is because apps offer more of single-use functionality, often creating a silo effect between the user and the application. With the silo effect, users may be “trapped” in a single brand experience, with less access to competing companies (Ling & Svanæs, 2011). This consideration brings concerns of a closed Internet dominated by well-known brands.

2.3.2. Awareness and Social Sharing

Social shopping is also now emerging as a commercial practice. This section looks at past research in awareness and social shopping to provide a background for this component of sCommerce. Understanding literature on awareness and sharing is important, as ubi-commerce relies highly on the importance of understanding different relationships and the frequency in which an awareness of others is desired.

A widely adopted form of sCommerce is group-shopping sites such as Groupon. Group-shopping and buying is not a new concept; offline “club plans,” such as those created by the Great Atlantic & Pacific Tea Company and the Larkin Company, date back to as late as the 1800s (Jia & Wu, 2012). Couponing, a concept related to online group shopping, became popular in the 1930s because of the economic pressures of the Great Depression and allowed financially pressured Americans to save on expenses such as groceries (Jia & Wu, 2012). Their online counterparts, such as Mobshop, Mercata, and Letsbuyit, have been trying to reach Groupon status since the late 1990s.

2.3.2.1 Social Networks

Online social-networking sites have dramatically changed the way people use the Internet. With the mass adoption of Facebook and Twitter, introspection suggests one may expect more social integration from all online presences, even commerce websites. In this next section I review studies conducted about the social-network site, Facebook, as it is one of the

primary online social networks. This review will allow a better understanding of Facebook users and what tools they use. Recent studies (Barkhuus et al., 2008; Barkhuus & Tashiro, 2010; Joinson, 2008; Lampe, Ellison, & Steinfield, 2008) provided detailed results about Facebook users' usage, gratification, and motives from an online prospective and offline socialization perspective. These studies help identify and further illustrate social groups in ubi-commerce.

First, Joinson (2008) studied users' gratification and uses of Facebook and found that they related to one another in keeping in touch with friends, social surveillance, communication, and making new contacts. Following from this, they suggested that social-network sites be designed to allow users to continue the surveillance of friends as well as expand on self-presentation tools, and design features and functionality with the goal of reconnecting and maintaining friendships. Lastly, researchers suggested more granular privacy options to allow flexibility for the varying needs of different users and those who are viewing their profiles.

Barkhuus and Tashiro (2010) explored social networks, specifically Facebook, focused on how they affect offline relationships. Here they documented the important role that Facebook plays for managing friendships with weak ties, which is described as "functional maintenance". Facebook's less personal means of communication (e.g., lightweight interactions) lends itself appropriately to this usage (Barkhuus & Tashiro, 2010). Facebook tools, such as showing the guest lists for scheduled events, status updates, and messaging, also enhances this concept. They also described how casual online communication "spills-over" to casual offline interactions.

2.3.2.2 Awareness and Sharing

Over the last two decades, social media and other Internet services have transformed the way one communicates and maintains knowledge of the activities and well-being of family and friends. Here I review topics related to how people communicate awareness and share online to provide context around the online space and the impact these topics have on all online services, even commerce. In this area, Tee et al. (2009) explored how extended family members—people who are related but do not live in the same household—maintain a sense of connectedness or affective awareness around social communications. They concluded that phone and e-mail were the most popular communication mediums for staying current with remote family members. Participants knew much about their extended family members' technical infrastructure and preference for technologies when choosing communication technologies.

Neustaedter et al. (2006) explored existing interpersonal relationships, how they were formed, and how they were maintained. They outlined a model that described that people have a range of needs for staying in touch with family and friends. They articulated two broad clusters of contacts: those where a strong need of awareness was communicated, and where the need is described as “more discretionary” (Neustaedter et al., 2006). It is likely that these relations will be similar to how users interact with family and friends for group shopping, although there have not been any study results that support this. Chapter 6 explores this concept in more detail.

Ahmet and Matilla (2012) recently completed a study specifically looking at how users recommend mobile applications. Even though mobile apps are digital in nature, the majority of recommendations were the results of face-to-face communication. The second most popular way of recommending apps was through social media, another very personal communication tool but using technology to bridge that connection.

2.3.2.3 Impression Management

Understanding people’s impression of management motivations behind sharing practices in technology is important, as sharing awareness or sharing shopping activities in group-shopping sites involves presenting and managing one’s identity. Goffman (1959) defined identity from a sociological perspective as the mental model people has of themselves; their self-image, comprising a variety of attributes and characteristics such as socioeconomic status, attitudes toward others, competence, beliefs, trustworthiness, and emotions (Waskul & Douglas, 1997). These attributes will evolve throughout one’s life, but for the most part, people’s mental conceptions of themselves will remain consistent. People present their self-image to others through their interactions in everyday life (Goffman, 1959; Waskul & Douglas, 1997). These interactions include exchanges with other people and their projected image while undertaking activities. Information is presented voluntarily (e.g., through speech or explicit actions) and involuntarily (e.g., through body language; Goffman, 1959). Goffman describe this interaction as a performance by an “actor” to an “audience” (e.g., those observing), aided by other “cast members” (e.g., friends, colleagues) who help establish and maintain one’s identity. Thus, people can infer another’s identity by observing their conduct and also learning about past activities and actions (Goffman, 1959). People also use other pieces of information, such as appearance or biographical data, to infer one’s identity (Goffman, 1959); however, this can sometimes lead to stereotyping. Knowledge of the identity of others allows people to define their

situation, know what to expect from others, and know what others expect from them (Goffman, 1959).

Voida, Grinter, Ducheneaut, Keith Edwards, and Newman (2005) explored impression management in iTunes music sharing. They found users in a workgroup setting felt pressure to adapt to group norms and participate in music sharing when they saw coworkers participating (Voida et al., 2005). Other findings pointed clearly to aspects of impression management such that coworkers would be quite mindful of what music they shared and how others would perceive it (Voida et al., 2005). Also, participants made use of iTunes as “an explicit mechanism of awareness” (Voida et al., 2005). The iTunes system was essentially informing the office of the locations of users, helping to establish impressions, and when absent, feelings of social loss were reported.

Similar to Voida et al.’s (2005) study, Sadeh et al. (2009) uncovered surprising results when they completed a study focused on understanding users’ attitudes toward privacy when they interacted with location-sharing mobile applications. Although the study was focused on attitudes on privacy, the results surprisingly focused on users using the app as a social awareness and engagement tool, whereas privacy concerns became less of an issue.

2.4. Summary

In summary, this chapter has presented a comprehensive review of literature relating to the central domains of ubi-commerce. This was achieved by presenting three topic areas: eCommerce history and trust, identifying the history eCommerce has with the importance of trust; mobile commerce, as a new phenomenon and how mobile payment fits into mCommerce and, important contextual factors such as awareness, social sharing, mobile usage and usability; providing situational understanding for the overarching ubi-commerce phenomenon. Mobile and social-networking adoption is accelerating. This chapter provided an understanding of research on mobile commerce challenges such as differed transactions, usability issues, and initial ideas about which users to target and how to target them. Further, research on social networks, sharing, and awareness online was presented to provide a lens around this important space.

In the next chapter, and subsequent six chapters I provide detailed accounts of three study methodologies and findings.

Chapter 3. mCommerce Study Methodology

This chapter presents a detailed description of the methods, data collection, and analysis used in the first study of this dissertation. The goal of this study was to better understand mobile shopping users, their habits and routines, and trust behaviours. This goal maps directly to the first objective of this dissertation—*Gain insight into mCommerce users' routines and social behaviours to inform design*—which addresses Research Question 1. Methods used for this study included daily electronic diaries and semistructured interviews.

3.1. Participants

Seventeen adult participants (nine female, eight male) were recruited for the study. All participants were regular mobile-device shoppers, defined as having purchased online at least once every two weeks. I chose regular mobile shoppers because their shopping behaviours and trust issues were less likely to be a result of new user adoption or novelty. The recruitment strategies included advertising in social-media applications, to undergraduate classes, and through e-mail forwarding as a form of snowball sampling. All participants but one was from Vancouver, British Columbia, Canada. Participants' ages ranged from nineteen to 44 and occupations varied markedly (e.g., students, social workers, designers, salespeople, teachers, administrative assistants, and marketers). Participants also varied in 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. In all cases but the iPad, the participants carried their devices with them nearly all the time.

I purposely recruited participants with a wide range of ages, occupations, and smartphones so results would be more generalizable to the general population, not a specific demographic or user case. This is also true for Studies 2 and 3, as I did not know what we would find in each study, I simply sought broad representation. Future studies could look at specific demographics where they could build on this work.

3.2. Method

The study method was deliberately exploratory, despite there being existing knowledge of mobile-device routines, eCommerce activities, and trust frameworks. I wanted to explore mCommerce without preconceived notions of what the activity “should” entail. My focus was also specifically on *mobile* shopping and not on providing detailed descriptions of eCommerce practices, such that one could properly and deeply compare eCommerce to mCommerce. I recognize, however, that what is or is not mCommerce is a gray area. Historically, mCommerce was defined as shopping on devices with continuous Internet connectivity (Tiwari & Buse, 2008). Yet with an increasing number of computational devices available in varying sizes and shapes with different levels of connection, this definition is dated. For clarity and focus then, this study looks specifically at shopping on devices that are easy to carry and take with a person (e.g., they are mobile), where they may have either continuous or intermittent Internet connectivity. Thus, the study focuses on shopping on smartphones, tablets, e-readers, and mobile music players (e.g., iPods) with shopping capabilities, but not on computers or laptops.

Of the exploratory HCI studies on participants that are mobile, the majority use combinations of diary entries or semistructured interviews (Nylander et al., 2009). These researchers often stressed the importance of capturing the user while the event was still on their mind (Brandt et al., 2007; Carter & Mankoff, 2005; Schmidt-Belz, 2003; Sohn et al., 2008,). The follow-up semistructured interview gives participants an opportunity to provide more detail on what they have recorded *in situ*. The interviews also give the researcher the ability to clarify any entries, if needed. Kindberg et al. (2004) found that participants did not change their opinions on security and trust after being prompted with questions on the topics.

Mobile conditions create new problems when capturing dynamic and varied activities and diary entries allow for descriptive accounts that move beyond counting events and focus on descriptive accounts (Palen & Salzman, 2002); problems are circumvented by allowing participants to be in their natural settings, but still allows the researcher some control. The limitations of diary entries as a method are based on when the participant fills out the diary entry. If participants create a diary entry as soon as the activity occurs, this could intrude on the authenticity of the activity. However, if the diary is filled out at a later time, it is possible valuable details could be forgotten. A study conducted by Brandt et al. (2007) showed that capturing a snippet of information in the moment could help users remember details to report later. Palen and Salzman (2002) also explored a similar concept with voicemail diary studies, although they

reported concerns of having the capturing device also being the object of evaluation. When compared to semistructured interviews, the results showed more self-reported rationale behind certain behaviours and higher participation, which they attributed to the personal relationship formed between researcher and participant.

Based on this past research, the study method consisted of two distinct stages.

1. ***Electronic Diary.*** Mobile-device activities can take place at various times and places and thus it can be difficult to directly observe these activities (Karlson et al., 2010; Nylander et al., 2009; Palen et al., 2000). For this reason, participants first kept an electronic diary of their mCommerce activities over a period of three weeks where I asked them to fill out an online form for each of their mCommerce activities. This online form included both shopping (without purchasing) and buying. The diary form shown in Figure 13, asked participants to describe their activity, any concerns about trust (where I purposely did not define “trust”), and their location when the activity occurred. Participants received a daily reminder through e-mail and SMS, encouraging them to visit the e-diary form and enter their mCommerce activity for the day. Participants were also asked to send in a diary entry even if they did not partake in any shopping activity that day to indicate this was the case. To aid in accessibility, participants were asked to install a shortcut on their computer and mobile devices to the diary webpage.

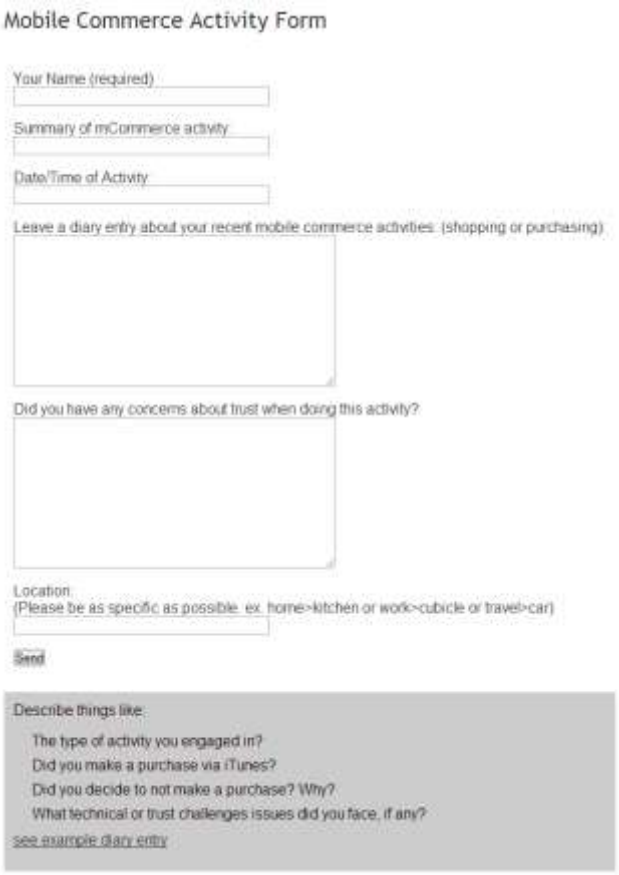

Figure 13. **Mobile commerce diary-entry form.**

I recognized that participants might not be able to make a diary entry as soon as they participated in a mCommerce activity due to the mobile and likely spontaneous nature of such activities. It was also apparent during test runs of the study that memory aids were useful when making diary entries. Because of this, 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; screenshots were used done in similar studies (Karlson et al., 2010). Participants could upload screenshots using the diary form. Figure 14, ***Figure 15***, Figure 16, and ***Figure 17*** show screenshots submitted by participants during the study. Figure 14 shows a movie ticket purchase for a local cinema. ***Figure 15*** shows a screenshot of a Groupon deal a user is about to purchase. Figure 16 is a screenshot of the popular young adult

clothing store, Urban Outfitters. ***Figure 17*** is a screenshot showing the iTunes interface as a user is redeeming a gift card to purchase music.

Figure 14. Screen shot of movie ticket purchase

Figure 15. Screen shot of Groupon deal purchase

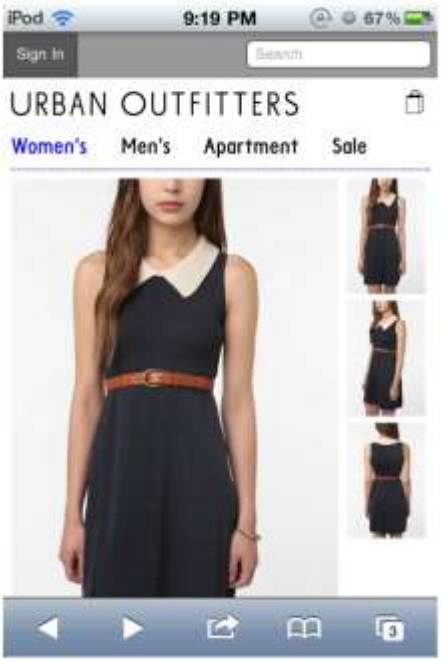

Figure 16. Screen shot of clothes shopping

Figure 17. Screen shot of iTunes purchase

2. ***Semistructured Interview.*** Following the three-week diary period, I conducted a semistructured 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 additional insights. Example questions included What prompted you to perform the activity?; What were you doing before/after the activity?; Were you familiar with the company you purchased or shopped from?; and Did you have any trust concerns. These questions were chosen to comprehensively understand the participants' motivations around trust and an overall understanding of their historical mCommerce experience. For a full list of interview questions see the Appendix. All participants were paid a total of $40 once they completed both study stages. The Appendix also includes the recruitment poster used to solicit participation. The diary entries and interviews took place over the summer months of 2011; thus, they did not span any major holidays known for "excessive" shopping. As a result, the study's findings are focused on everyday shopping.

3.3. Data Collection and Analysis

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). All interviews were audio recorded to review interview data numerous times. The transcript also included handwritten or typed notes as well as the participant's diary entries and submitted screen shots. All of this qualitative data was then coded and analyzed by domain and repeated text data, as outlined in Schensul et al. (1999). Open coding—the process of uncovering naming and developing concepts to open up text and expose the participants' thoughts (Strauss & Corbin, 1998)—specifically involved me reviewing printed out transcripts, then hand writing codes on common themes. For example, the code when participants were asked why they purchased or shopped during a particular incident, these responses ended up in one of four codes: [sn] they had a specific need, [ip] the activity was done on impulse, [pr] peer recommendation, [ft] just looking to fill time, or [r] related to their routine. After all transcripts were coded out, patterns were discovered, then categorized and subcategorized. This was done by grouping the text into similar domains, by putting the participants' comments into a spread sheet with their assigned codes and then going line by line grouping codes into categories (e.g., types of purchasing habits and routines, what was

purchased, trust mechanisms, etc.) and broad themes by using affinity diagramming. This was the process by which axial and selective coding was used to reassemble the data into statements about the relationships between concepts (Strauss & Corbin, 1998). The affinity diagramming specifically involved me drawing out the categories and themes to get a visual representation of how the ideas flowed and represented the findings as a whole. This also allowed me to easily identify any overlapping ideas and/or misplaced categories and rearrange the concepts if needed. These categories and themes identified through this process are discussed in the next chapter.

3.4. Summary

In summary, this chapter provided a detailed review of Study 1's participant-recruitment strategy, participant demographics, the methods used, and how the data was collected and analyzed. Specifically I selected an electronic diary (with screenshots) and interviews as they correlate well, based on the mobility requirements and technology available to the user for this study. Studies 2 and 3 followed similar recruitment, method, and analysis as the studies are closely aligned in objectives and goals. There were some modifications in methods to adapt each study to specific needs. These method decisions are detailed in their respective method chapters, Chapters 5 and 7.

In the next chapter, I outline the results from this study, focusing on several main themes found in the data. For example, I describe shopping and purchasing activities such as what people commonly shop for and purchase, as well as when and where people shop from and why.

Chapter 4. mCommerce Routines and Practices

This chapter reviews the findings of the first study of this dissertation situated in mCommerce. I detail the trust concerns (or lack thereof) participants experienced and the reasons for this level of trust. These results address the first research objective of this dissertation and answer Research Question 1.

4.1. Shopping and Purchasing Activities

Participants used their mobile devices for a large variety of mCommerce activities, shown in . This activity 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 I 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. Items varied and included clothing, housing accessories, shoes, car insurance, cellphone accessories, toys, and pet products. Reasons for not purchasing included a high price, the item or service was not what they were looking for in location of the service, quality of the product, or they were just browsing for fun and nothing particularly attracted their interest. Most shopping was done in apps created and published by specific stores (e.g., eBay or Amazon). To a significantly lesser extent, some participants used 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, operating system upgrade, and a podcast.

Participants bought a variety of real-world items including movie or sports tickets, food, jewellery, shoes, yoga classes, flowers, eBooks, books, and clothing; 17 participants logged in to a previously created account to make a purchase, including using Amazon and eBay apps

along with apps made by social-couponing sites and local food stores. The other eleven participants entered their credit card information from scratch into a web browser page to earn additional credit card points, or because the company did not have an app with recorded payment information.

A breakdown for the cost of items/services/products people shopped for is shown in Table 2

Activities Across Diary Entries

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

Table . This illustrates that people predominantly shopped for small-value items on their mobile devices, but occasionally people did shop for more expensive things. When it came to whether people purchased these items, there was a greater than a 76% purchase rate for items under $5. Only five of the 25 $30–$100 products were purchased or downloaded. Only two of the $100–$350 were purchased or downloaded.

Table 2

Activities Across Diary Entries

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

Table 3

Cost Across Diary Entries

Cost	%
Free	30.0
$1–$5	5.0
$6–$30	30.0
$31–$100	14.5
$101–$350	14.5
$350+	6.0

4.2. Daily Routines and Timing

I 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. As illustrated in Figure 18, 18% of participants primarily focused on fixed time intervals for shopping, 35% primarily shopped as a habit or routine, and 47% of participants were spontaneous in their mobile shopping. I now review these three categories in detail.

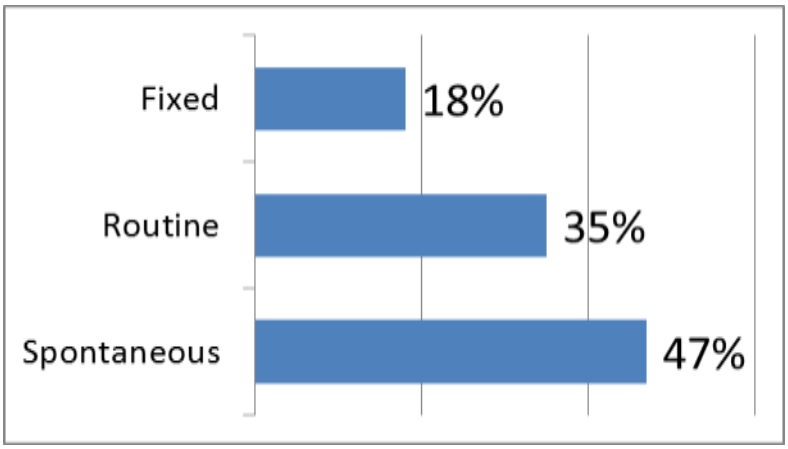

Figure 18. **Daily routines and timing.**

4.2.1. Spontaneous Mobile Shopping

Close to half of the participants (eight 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 prompts 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. For example, when asked on the diary form why they engaged in each shopping activity, P2's diary described several points in time when other activities were the prompt, both on and off the mobile device:

> While in future shop we were about to purchase a laptop when we thought we saw it at London drugs for cheaper —P2
>
> Today I received an email that OS Lion was ready to download and purchase —P2

P9's diary entries also reflected very spontaneous shopping activities. These activities included browsing for products based on recommendations from friends (in person and through online messages), going on a vacation to Seattle and looking for a tourist pass, and looking up board games after a night of playing games with friends.

4.2.2. Shopping as a Habit or Routine

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

Routine shopping was most often reported to occur during public transit rides to or from work or school. In these situations, participants often had unscheduled time and would shop in these moments. The mobility of their device and constant Internet connectivity made this possible. For example, six of seven diary entries made by P1 were shopping activities that occurred during the participants' commute from home to work, all occurring within the same two-hour window of time. This shopping occurred despite the participant feeling that shopping activities were more spontaneous in nature than routine. Although the items purchased may have been spontaneous, the routine nature of the timing of such shopping activities was clearly prevalent for the participant.

For some participants, the routine act of shopping was tied strongly to checking their e-mail, which was also a routine act performed at particular times in the day. For example, P8 recorded eight diary entries, all of which took place while on the train commuting to school in the morning and shortly after the participant checked e-mail. P8's diary entries replicated the same scenario repeatedly:

> I went on the Internet to check my email and saw a daily deal for Groupon —P8
>
> While waiting for my train to class, I went on the Internet to check my email and saw the daily deal for Indulge and Groupon —P8
>
> Checking email while taking [train] to school this morning. Saw Groupon and Indulge daily deal. —P8

Other participants were also prompted to shop based on their routine checking of e-mail, but these activities occurred either at home or work where the timing was typically the same each day. Timing included first thing in the morning, first thing once arriving at work, or in the evening before bed. E-mail prompts ranged from eBay alerts of daily deals to "one-off specialty

store" promotions. For example, P17's fifteen diary entries all involved the same routine of checking e-mail:

> Every morning I wake up, shower and everything, flip through my emails, either first thing in the morning, before I leave for work or first thing when I get to the office … that is what I do every day, literally, every day … if something comes in, in the middle of the night, I want to get a jump on it and if there is deals within those I share with my friends. —P17

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. They were interested in specific items rather than "filling the time." This mode of shopping illustrates the more targeted nature of some participants' shopping routines. For example, P15 is an avid collector of pens, inks, and flutes and satisfies these interests by frequently browsing eBay for "good value" items to add to P15's collections. The participant talked about shopping during routine times:

> It was my usual browsing time after lunch. —P15

P10 was remarkably similar to P15 and frequently shopped on a mobile device on eBay (using its app) and specialty stores. Here the interest was in specialty clothing and occurred at P10's desk at work (where shopping was done on a mobile device and *not* the computer) or at home with the majority of activity happening late at night. Several diary entries from P10 illustrated this behaviour:

> Decided to check on what's new at Macy's for the Sean John Men's line —P10
>
> Quickly checked on eBay to see the Sean John auctions as it has been a while since I last checked. —P10
>
> Went on to Dr. Jay's to check out the Sean John clothes. —P10

In summary, I saw several interesting patterns in these results. First, not all participants restricted themselves to purchasing in the privacy of their homes. This pattern suggests a lack of concern that others might see their shopping activities, in particular, in places of (often) tight quarters such as public transit. Second, I saw a strong tie of mCommerce activities to the routine checking of e-mail from companies as well as friends. I return to this later as one important factor affecting trust. Also, I saw participants engaging in shopping and purchasing over their mobile devices at home or work even when a personal computer was available and nearby. When at home, the most common location that users participated in shopping activities

was in their bed (e.g., late at night). Participants indicated the mobility of the device allowed for greater ease of use in this location.

4.2.3. Shopping During Fixed Time Intervals

I also saw that although not necessarily routine, three participants had fixed time intervals when they would shop. That is, they would shop at a certain time, yet they would not do this on a consistent basis and they were not 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 when 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 prompt for the activity. They shopped out of a desire to shop. A participant would similarly shop in the evening when at home after work. This too was not a recurring routine, but the shopping always occurred at this time and place when it did happen:

> Well I suppose I don’t really use it to browse (shop) when I am at work, because I just use it for my emails and my work related stuff and then by the time I get home it is about 6:30pm-7:00pm and then by the time I eat it is probably 8pm and that is when I have spare time to mess around and do shopping. —P16

4.3. 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 (Luo, 2002). I explored four reasons for this next: perceived little risk by the user, brand confidence, and recommendations from friends and family.

4.3.1. Little Risk

First, many participants believed that most of their mCommerce activities presented little actual risk to them. Participants who felt there was little risk were not surprisingly those who: spent very little money, mostly only acquired free products or services, or simply shopped rather than purchasing goods. For example, P2 and P4 both said they had no trust issues because

they did not actually purchase anything. P9 elaborated with a very common reaction from participants who just shopped:

> I was just looking at prices and seeing product descriptions so I don't have trust issues associated with that. —P9

P5 similarly said he had no trust concerns when downloading a podcast because "it's free and no cost is involved." Low-cost items were also often regarded as low risk because of the cost of the service or product.

In contrast, one participant did mention trust concerns when buying free or low cost items. P13 only downloaded free applications for a mobile device, but instead of seeing this as little risk, P13 saw it as a potential invasion of privacy. The participant explained the concern:

> I briefly thought about how [the app] now knows about some of the types of music I listen to, after I played a song for the app and they offered me ringtones. Will they now try and market similar types of music/lifestyle products to me?

And during another free download purchase the participant mentions it made the participant wonder if this information was being accessed and used for marketing.

Although seemingly mundane, the above findings show that when people think about trust in their mCommerce activities, they think mostly about loss of money. Because the cost of many items (e.g., apps for their devices) is low or free, they do not feel trust is a concern. Yet many other issues could arise and pose trust issues for mobile shopping and purchasing such as the revealing or surreptitious use of personal information (e.g., credit card information), the tracking of one's browsing activities, the tracking of one's purchases, and poor quality of service. P13's comments begin down this path; however, this line of thinking was rare among participants.

When items were expensive, participants never mentioned a heightened level of trust. Instead, they would comment on the cost being too high. One participant, who bought car insurance, a $550 purchase, indicated having had no problem ordering over a mobile device but the company would not allow it. Instead, the participant had to migrate from shopping on a phone to purchasing on a computer.

4.3.2. Product and Store Brands

Aside from a lack of risk due to little money being exchanged, brand played the most significant role in trust for mCommerce. By brand I refer to the actual company with which participants engaged to shop or make purchases (e.g., the eBay app or 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 that indicated no past experience with the vendor. Some comments about large well-known brands included the following:

> Amazon is a trustworthy site. —P10
>
> eBay is a trusted company. —P15
>
> [Macy's is] the most reputable big department retail store in the U.S., so in terms of security, if that fails I don't know who to trust then. —P10
>
> [The] Apple App store is an official app for Apple brand and since Apple is a famous brand so I have no problem trusting and purchasing online with them. —P8

In cases when participants had negative feelings toward a brand, the company's app was not downloaded to the person's mobile device. Participants knew the companies before they would shop at their stores (via the store's app) on their mobile device.

Several participants commented that they repeatedly purchased from the same places and this history made them feel safer and led them to trust the company and their activities with it. For first-time shopping with a particular company, participants relied on other indicators to increase the level of trust they felt. These included the overarching approval process of many mCommerce applications and relying on the recommendations of others; I discuss these in the next two sections.

4.3.3. Brand Transfer Through the App Approval Process

In addition to trust in store and product brands, 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, if participants were using an app on their mobile device for shopping, regardless of which company made the individual app, because the app had been approved through a larger trusted company (e.g., Apple), the

trust the participant had with that company transferred to the app itself. A similar phenomenon occurred for purchasing or downloading apps themselves. Because a larger, trusted company approved apps, apps themselves were considered to be trustworthy.

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 "prescreening" that the company does before permitting an app to be present in the store.

> Everything is prescreened in the [Apple] app store, so there is no worry about [trust]. —P1

> It just feels like a more cohesive thing when it is under that one umbrella company of Apple … [not using the app store] just feels like you are opening up your phone to all the Internet and random companies. —P4

> It was through iTunes so I didn't have any trust issues. … I trust the iTunes brand and I believe they really check the quality in products before they release them. —P17

I also found that in some cases participants were not conscious of the mental transfer of trust between brands in this way. For example, during some interviews, participants would first claim they would not download an app without knowing the company that created it or offered it. However, in subsequent interview questions, they admitted to doing just that.

4.3.4. Recommendations from Friends or Family Members

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

The types of items and stores on which people received recommendations varied significantly. For example, P1 downloaded a sports-team app for a mobile phone based on a friend's recommendation, P2 downloaded a recipe from a recipe site recommend by P2's partner, P9 shopped for racquets based on the recommendations of a friend, a tennis professional, and P13 bought frozen yogurt based on a friend's recommendation. Perhaps the most self-aware of the influence that friends had on shopping.

> I have a whole shopping network. … Me and my friends all use Groupon. —P17

Because of the social influence of others, interactions with particular vendors or products were deemed to be trustworthy, regardless of whether they actually were in fact. The sheer act of social recommendation elevated companies, brands, or items to a trustworthy status. In most cases, social recommendations were from close friends or family members, yet they did sometimes come from strangers when a person would rely on them if there were a large response from people:

> The seller has 100% positive feedback on eBay and I don't buy from sellers that [have] neutral or negative feedbacks. —P15

4.3.5. Mistrust

In some cases, mistrust did arise but this was rare. Across all 161-diary entries, only eleven entries indicated there was a trust issue (see Figure 19). The reasons for why participants had trust issues often related to reasons discussed above for assuming trustworthiness.

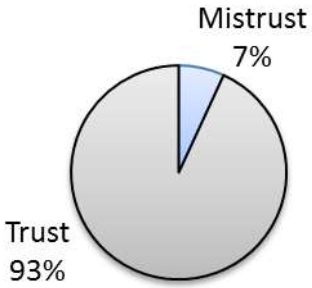

Figure 19. **Reports of mistrust vs. trust in diary entries.**

4.3.5.1 Social Recommendations.

Four diary entries discussed a lack of trust in the purchasing of a mobile device app because the app had a low rating from other users. In only one case did the participant continue downloading the app. Another participant commented,

> I decided not to download even the free version because the comments were all negative.

Together, these viewpoints suggest that even if a person does not receive advice or recommendations from people they know, if there is a large enough response, they will rely on the advice of strangers.

4.3.5.2 Brand

In total, four diary entries related to mistrust because of brand. Two diary entries by the same participant reflected instances where the participant did not trust a brand because of a lack of recent history with it. When asked if there were trust issues, the participant said, in the first instance,

> Yes, as I have not purchased on this site before.

and, in the second case,

> Yes because I haven't ordered flowers for a long time and I couldn't remember what website I had used before.

In addition to this, I saw two more diary entries in which the brand (the company) was not trusted because of the company's location; one was located in Hong Kong and one was in England, which are both a long distance from the participant.

4.3.5.3 Hard Trust Issues

Two diary entries related to hard trust concerns. One participant was concerned about a potential virus, whereas another was worried about the security of the wireless network they were using in a mall.

4.3.5.4 Other Reasons

In addition to the above, participants cited usability issues (one entry) and the limited ability to physically evaluate a product (one entry) as reasons to mistrust mCommerce activities. Although the frequency of the above occurrences was small, they suggests the importance of the aforementioned reasons people have few trust concerns in their mCommerce activities.

4.4. Discussion

The purpose of the study was to explore people's mCommerce routines and activities, identify how people think about trust during these activities, and understand how trust affects their shopping and purchasing behaviours. I now turn to a discussion on these results and reflect on the related work for mobile-device usage along with theories of trust.

4.4.1. Mobile Device Usage

First, my work builds on the related work of mobile-device usage; knowing that mCommerce activities occur in a variety of locations, including the home, public transit, and, to a lesser extent, at work. This concern for location builds on the Nylander et al. (2009) location classification for mobile-device usage and illustrates that people turn to their mobile devices for shopping, even if computers are located close by. A large amount of mCommerce activities relate to purchases for the mobile device itself, and also, people simply have a preference for shopping in this way. Like the consumption of mobile video and video telephony services (O'Hara et al., 2007), mCommerce activities occur in public spaces like transit commutes when the act of shopping represents a private activity in a more public space. I found that shopping activities typically stay on the mobile device with little concern to migrate the activity to other computers or devices; this finding contrasts with the Karlson et al. (2010) findings about e-mail-based activities. Palen et al. (2000) showed that mobile phones are very much social devices; I extend this to show the impact of social recommendations on mobile-shopping activities and trust. Similar to O'Hara and Perry's results (2001), I saw social collaboration as a major theme in user behaviour. However, in this study, social collaboration was just as much a catalyst to spontaneous purchases as a deterrent from purchases as well. Furthermore, I found no participants partook in mCommerce activities that originated from interruptive marketing efforts through mobile devices, such as explicit print, television, or radio advertising, which is a new finding.

There are certainly many possible design implications from these shopping behaviours. At the most basic level, they suggest that mobile-shopping designs could be created to target users based on these routines (or lack thereof) and optimize their experiences. For example, "fixed time" shoppers could be detected based on their pattern of usage and provided with a more browsing-like experience to fill their time.

4.4.2. Trust in mCommerce Activities

My work has illustrated the ways that trust is considered by people participating in mCommerce activities and how trust concerns are largely mitigated. First, Zucker (1986) developed three trust mechanisms—characteristic-based, process-based, and institutional-based trust—that have been used as a lens for eCommerce trust (Luo, 2002). Looking at these mechanisms in relation to the findings about mCommerce, it is clear how some of them continue to play a significant role in establishing consumer trust. However, the fulfillment of these mechanisms often took on a new form that was specific to mCommerce when compared to eCommerce or traditional retail shopping.

4.4.2.1 Characteristic-Based Trust

Characteristic-based trust refers to trust that is developed through similarities between consumers and companies (e.g., similar gender, ethnicities, and affiliations; Luo, 2002; Zucker, 1986). In an age of mobile shopping, devoid of much human contact (at least between company employees and consumers), one might think it would be hard to establish trust in this way. Yet, as the results showed, many participants engaged in mCommerce activities that were initiated by a friend or family member's recommendation. Because of the social recommendation, people placed trust in a site, service, or product, regardless of whether it was worthy of trust. Thus, having friends, family, or, to a lesser extent, social networks provide recommendations for shopping makes characteristic-based trust a key component for mCommerce trust.

This is promising for companies; however, if one thinks about targeted advertising, consumers face a challenging future where it will be increasingly difficult to know if social recommendations are valid. For example, social networking sites (e.g., Facebook) are increasingly placing advertising among information about one's friends and family. The mere placement of such information in close proximity to one's trusted social network may easily suggest a false sense of security for mCommerce activities.

4.4.2.2 Process-Based Trust

For process-based trust—trust that is built through a history of past transactions (Luo, 2002; Zucker, 1986)— even though participants experienced a new medium for shopping (e.g., mobile shopping), they brought notions of trust with them through prior experiences with eCommerce and retail experiences. For example, they continued to shop with companies that were previously known to them in the nonmobile space, such as eBay and Amazon. For

companies that are designing applications to support mCommerce, this suggests that designers should fully integrate their mobile-commerce opportunities with existing commerce sites and interactions such that notions of trust will transfer. For example, a company that presents an eCommerce web presence should provide a similar mCommerce presence in look and feel, such that a person could easily migrate between the two. Some companies already do this to a certain extent (e.g., eBay); the importance in doing so relates to trust.

4.4.2.3 Institutional-Based Trust

Institutional-based trust relates to trust that is established by presenting a public presence that is respected and shows integrity (Zucker, 1986). This is commonly accomplished through third-party guarantors or membership in associations with professional codes of conduct (Luo, 2002; McKnight et al., 2002; Zucker, 1986). The definition of this type of trust mechanism did not historically include distribution models such as app marketplaces, yet these have in essence played the role of third-party guarantors when it comes to mCommerce. That is, the (often stringent) approval processes (e.g., Apple's App Store) that mobile apps must go through before they are placed in the hands of consumers acts as a guarantor of service or products acquired through it. This is true regardless of whether such approval processes actually do make companies more trustworthy in their apps or shopping services. For consumers, it does not matter; consumers simply assume that is the case.

One could argue that historically this trust role has been associated with search engines in eCommerce. Yet in mCommerce, app marketplaces have now taken over this role. Although the creator of the app might not get the brand recognition for the experience, in the mobile space this seems to be one of the best ways for companies to get their products in the hands of potential new users. Traditional more obvious eCommerce institutional-based trust mechanisms such as third-party seals and security seals were never mentioned or made apparent among participants.

4.4.2.4 Consumer Vulnerability

Considering Head and Hassanein's (2002) factors, which make consumers vulnerable in eCommerce transactions—providing their e-mail address, shipping information, or credit card numbers—it is evident that these happen at the time of purchase. For example, a user must input detailed information to finalize a purchase on an eCommerce web site. Yet this does not transfer to mCommerce. As the results showed, nearly all purchases occurred through an app

marketplace, which means that purchase information went through the larger trusted brand provided by the marketplace and not necessarily at the actual time of purchase. For example, when making a purchase in the Apple App Store, payment information is entered when a user first creates an Apple account. Then, when consumers decide to purchase something through the App Store, they need only enter in an account password to make the purchase. This type of "automatic" payment eliminates factors of perceived vulnerability. One could compare this to the manner in which PayPal provides assurances for eCommerce.

4.4.2.5 Retail Shopping

Finally, Head and Hassanien (2002) developed a set of factors that described why it is difficult for eCommerce companies to develop trust, compared to retail stores (e.g., it is easy to create an eCommerce site). When considering mCommerce, less concern is present in establishing a mobile shopping presence, as there is typically a rigorous process to create and publish mobile apps. Participants recognized this presence and felt increased trust because of it. Similarly, one could argue because of the higher barrier of entrance, having a mobile presence would be a show of longevity similar to that of a physical investment. This would be akin to consumers being able to see a retail store's investment in buildings and personnel. In the case of human interaction, participants often relied on social recommendations and brand recognition to establish trust; this made such interactions less of a concern for mCommerce. Yet such social recommendations could easily become problematic if they are based on minimal knowledge.

4.5. Summary

This chapter explored the shopping and purchasing behaviours of users on their mobile devices through a diary and interview study. Here I found that mobile commerce activities are a ubiquitous activity that occurs in many places, including home, work, and in transit. For some, this is spontaneous, and for others it was either part of a routine or during fixed time intervals. For trust, many people had few concerns, perhaps attributable to several factors that map at a high level to trust mechanisms established for eCommerce. That is, most of the trust mechanisms/factors I saw for mCommerce could be translated in some form to those established for eCommerce. However, in each case, mCommerce brought unique nuances in how the trust mechanisms were being applied and thought about by users. The results suggest that because purchases were made on a mobile device, unlike personal computers, they tended

to be made from companies that 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). Compared to eCommerce, mCommerce seems to be more of an extension of the brand “experience” and less of a starting point in an introduction to a brand. The findings suggest that the more mCommerce applications tie to existing friend networks or established and known brands, the more likely people will trust them.

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 nonexistent in the eCommerce literature. Now, companies are migrating many strategies from mCommerce to the eCommerce domain where computer-based shopping and purchasing *can* be performed in app marketplaces as on mobile devices. For example, the Apple App Store can now be used on a Mac computer for buying software (e.g., programs or games). This suggests that commerce activities in the future will continue to blend eCommerce and mCommerce. I purposely did not study shopping on computers as my focus, yet future studies should investigate how mCommerce routines translate to this new paradigm of eCommerce shopping, or vice versa.

In this chapter I described the finding and key discussion points from Study 1, which focused on mCommerce. In the next two chapters I continue to explore the ubi-commerce phenomena by investigating a form of social commerce, group-shopping. In Chapter 5, I review the methods used and in Chapter 6, I present the findings and key discussion points.

Chapter 5. Social Commerce Study Methodology

This chapter presents a detailed description of the methods, data collection, and analysis used in the second study of this dissertation. This study involved semistructured interviews and mind maps as methods, deployed on users of group-shopping sites. The goal of this study was to understand group-shopping users' shopping networks and routines. This study directly maps to the second research objective, to e*xplore group social shopping online, and gain an understanding around how users interact with one another, how groups of shoppers are created, and what motivates users to shop in groups.* This chapter addresses Research Question 2 which is, *What user routines and social behaviours exist for group shopping and how well do group-shopping sites support them?* I expand on this further in the following chapter.

5.1. Participants

I recruited nineteen participants (six male, thirteen female) through word of mouth, social media, and online forums focused on shopping. All participants were from Vancouver, British Columbia, Canada. Ages of participants ranged from nineteen to 62 (median 30) and occupations varied widely (e.g., health practitioners, administrative assistants, students, stay-at-home moms, designers, fitness instructors, and systems administrators) and participants were all middle class with mixed ethnicities from North America, Europe, and Asia, with a mix of high school and postsecondary education. A copy of the recruitment poster is included in the Appendix.

Participants' technical abilities ranged from beginner to expert and all were frequent users of group-shopping sites. Participants also varied in the shopping sites they used. All but one participant used Groupon. Figure 20 shows an example of the Groupon website-user interface and Figure 21 shows an example of the mobile-user interface. Most group-shopping sites have similar layouts. Seven participants said they used Living Social, four participants used OneSpout to aggregate their deals, three used Swarm Jam, and two reported using local

group-shopping sites exclusively. Participants had all used group-shopping sites between six months and three years; thus, nobody was a novice group-shopping site user. I saw little variation in responses despite the diversity. Also, it should be noted that users reported on their own perspective of the group-shopping network to which they belonged, which is typical for studies of group activities.

As mentioned earlier, and similar to Study 1, I purposely recruited participants with a wide range of ages, occupations, and the group-shopping sites they participated in. This was again so results would be more generalizable to the general population, not a specific demographic or website.

Figure 20. **Groupon Desktop Website User Interface**

Figure 21. **Groupon Mobile Website User Interface**

5.2. Method

This study contained two parts, sharing maps and semi-structured interviews. These are reviewed in detail below within this section.

5.2.1. Sharing Map

First, participants were asked to draw a Sharing Map that depicted the people with whom they had significant online shopping interactions. Here participants drew or wrote the names of friends, family, and acquaintances. For example, Figure 22 shows a reproduced sharing map based on one participant's drawings. This participant wrote "Me" in the center of the map and then drew lines to point to the people with whom they shared and the people who shared with them. In this case, the participant used the direction of the arrowhead to indicate who was sending information about group-shopping deals. Double-headed arrows indicated mutual sharing of deals. Some people even wrote or drew the method used for sharing (e.g., SMS, Facebook, Phone, e-mail; see Figure 21, and

Figure *23*).

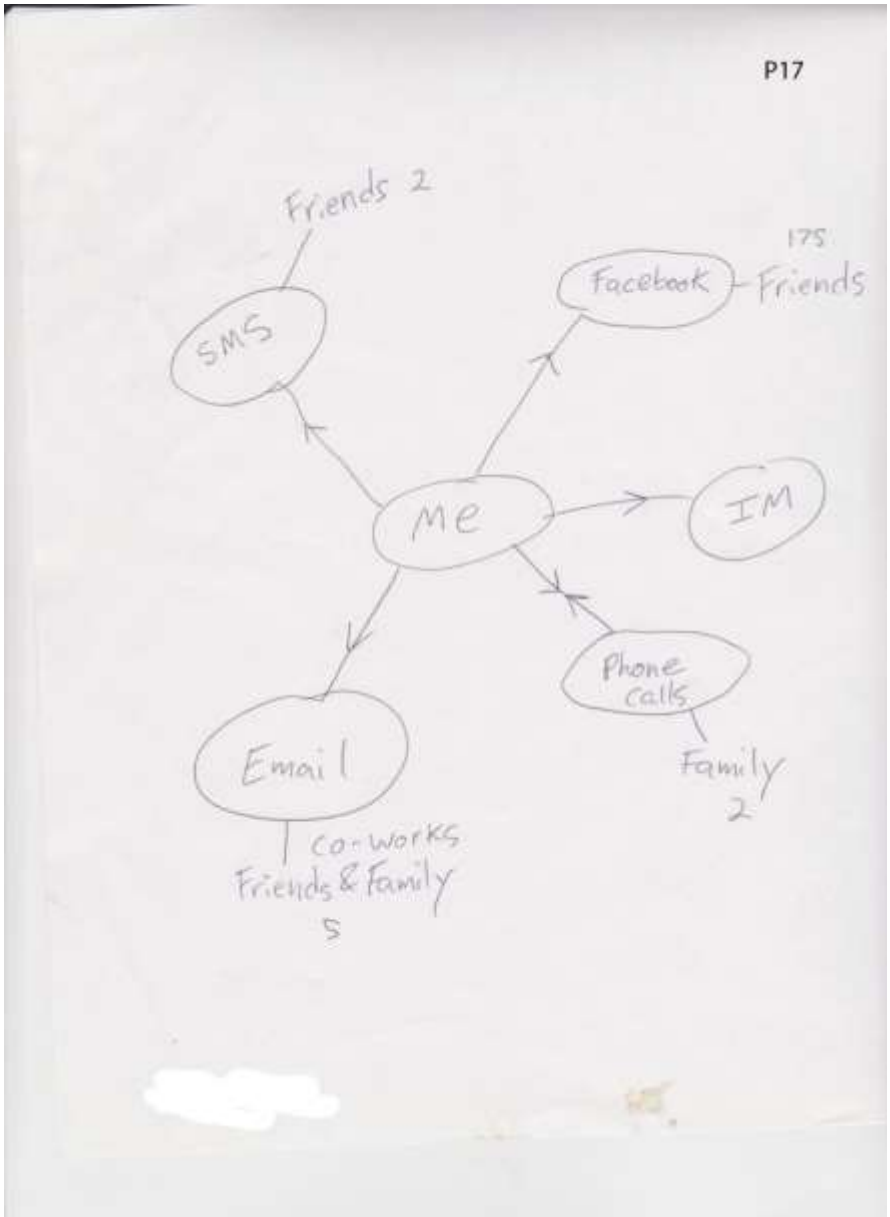

Figure 22. **P17's Sharing Map**

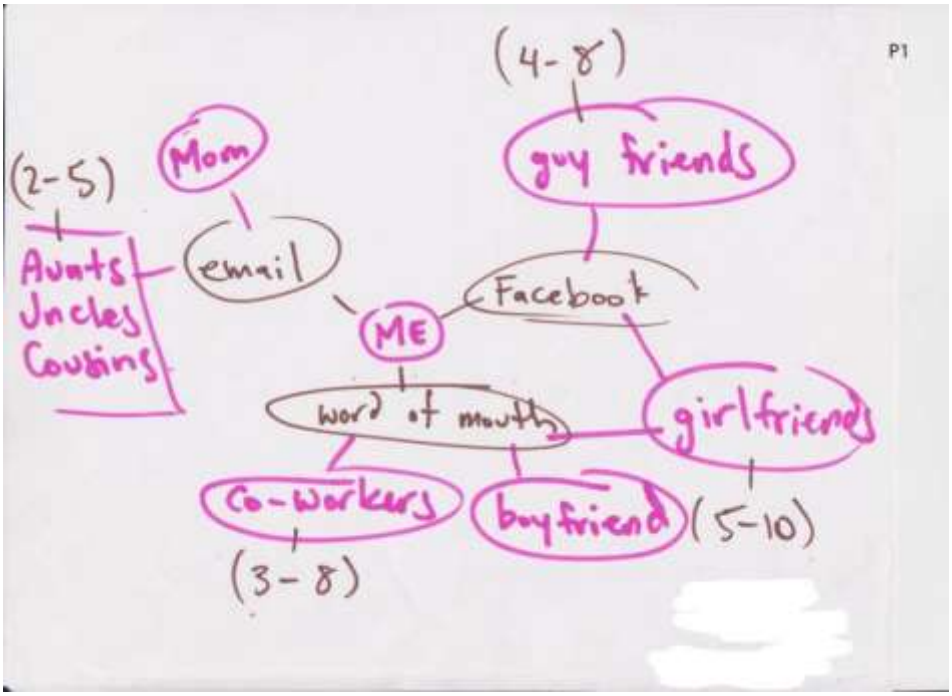

Figure 23. **P1's Sharing Map**

The maps produced by participants varied greatly; however, they all served an important purpose of opening up the conversation and providing grounded examples to which participants and interviewer could refer when discussing their shopping practices. This is consistent with past studies that have used a similar technique (Farnham et al., 2003; Neustaedter et al., 2006; Stafford, Stafford, & Schkade, 2004).

After participants completed the map they were asked to explain what they had drawn and why. I asked who the people were and how the participant knew them, why and how the participant shared with them and how often, how their relationships on the map related to their nonshopping relationships, and how the map had developed over time (e.g., if group expanded or got smaller).

5.2.2. Semistructured Interview

Next participants completed a semistructured interview that lasted between twenty and fifty minutes. Questions were divided into three areas:

1. Background. The first section looked at the participants' background on group-shopping sites. Questions explored how long they had used group-shopping sites, what sites they used, and what devices the participants used while browsing and shopping these group-shopping sites.
2. Sharing Routines. The second section focused on understanding participants' sharing habits. Participants were asked if they shared the deals, and if they did how they usually shared them with others (e.g., phone, text, e-mail, and instant messenger), who they shared them with, and what device they used for sharing (e.g., phone, tablet, PC, or laptop). Participants were then asked to recall the last time *they* shared a deal with someone else and to describe the activity. Finally, participants were asked to think of the last time a deal was shared with *them*. Questions, in this instance, aimed to understand why the participant received the share, who it was from, and how it was shared with them. Participants were also asked how representative these experiences were of their broader routines.
3. Purchasing Routines. The final part of the interview asked participants to think of two specific instances, the last time they shopped online (not using a group site), and the last time they bought something using a group-shopping site. Participants were also asked how representative these recent experiences were of their broader shopping routines and if they could think of any instances of shopping that were unusual or interesting.

For completion of the drawing exercise and interview, participants received $20.

5.3. Data Collection and Analysis

Similar to Study 1, I recorded and transcribed audio recordings for all portions of the study. This was done holistically rather than separately for each different research question. Combined with the transcripts were a participant summary I wrote out after their interview, as well as detailed interview notes, demographics, and their sharing map. These transcripts were then analyzed using open, axial, and selective coding to draw out the main themes and compare these findings across participants. This specifically involved me reviewing printed out transcripts, then hand writing codes on common themes. For example, codes that emerged from this study around who the user shared their deal with include: [fa] family. [fr] friends, [co] co-workers, and [aq] acquaintances. After all transcripts were coded out, I then put all the participants' comments into a spread sheet with their assigned codes. I then went line by line grouping codes into categories (e.g., sharing routines, size/make up of groups, how the shared, reasons for sharing) and broad themes by using affinity diagramming. This specifically involved me drawing out and colour coding the categories and themes to get a visual representation of how the ideas flowed and represented the findings as a whole. This also allowed me to easily identify any overlapping ideas and/or misplaced categories and make adjustment as needed. These categories and themes identified through this process are discussed in the next chapter.

5.4. Summary

In summary, this chapter provided a detailed review of Study 2's participant-recruitment strategy, participant demographics, the methods used, and how the data were collected and analyzed. Specifically, the methods included semistructured interviews coupled with mind maps. Similar to Study 1, semistructured interviews allowed for deep and intimate conversations about users' routines and habits. The mind maps provided a better understanding of users' social connections in their shopping group, and similar to other researchers (Neustaedter et al., 2006, Tee et al., 2009), I used these to help participants explore the space before direct questions were asked.

In the next chapter, I outline the results from this study, focusing on several main themes that emerged from the data, such as shopping and purchasing activities, to describe what people commonly shop for and purchase, as well as when and where people shop and why.

Chapter 6. Social Commerce Routines

Chapter 6 presents the findings for the study on sCommerce. The results from this study answer the second research objectives for this dissertation. Research Question 2 was answered, first, by outlining the attributes of the "groups" of people that participants included as part of their shopping networks. Second, I outline their routines for sharing shopping information with others. Finally, I describe the unique purposes behind their network-shopping activities.

6.1. Group-Shopping Networks

The sharing-map activity coupled with the interviews revealed that participants all had a distinct notion of who was part of their shopping network. In this section I describe these relationships in detail.

6.1.1. Network Size

Participants were asked with how many people they frequently shared shopping deals. Answers ranged from three to twenty people with a median response of seven individuals. It was clear that this number was nearly always purposely selected and directly related to the participant's ability and desire to provide quality interactions either online or offline with these people. That is, participants wanted to ensure they could maintain a good relationship with these individuals. For example, P9 indicated keeping the network small because the participant was "picky." Other participants expressed similar attitudes of quality over quantity when sharing.

> I only send it to people if I thought they would be interested in it; I wouldn't just send it out for the sake of it. – P13

Most participants reported they believed the size of their network was either expanding (seven participants) or staying consistent (ten participants), whereas two reported that their network was decreasing in size. In both cases this was due to a loss of local friends, one being because of a romantic termination and the other because of moving to another country. For networks that were increasing in size, it was because people found more friends that they

realized they could include in their shopping exchanges, given similar interests. It is important to note that participants talked about those who were in their shopping network from their own perspective. That is, I do not know if the people who participants described would similarly include themselves in the participant's shopping network, if asked.

Figure 24 shows the partition of group size by number of participants. Participants were asked with how many people they frequently shared shopping deals. Answers ranged from three to twenty people with a median response of seven. It was clear that this number directly related to the participant's ability and desire to provide quality interactions either online or offline with these people. As mentioned earlier in this section, participants continually expressed attitudes of quality over quantity when sharing.

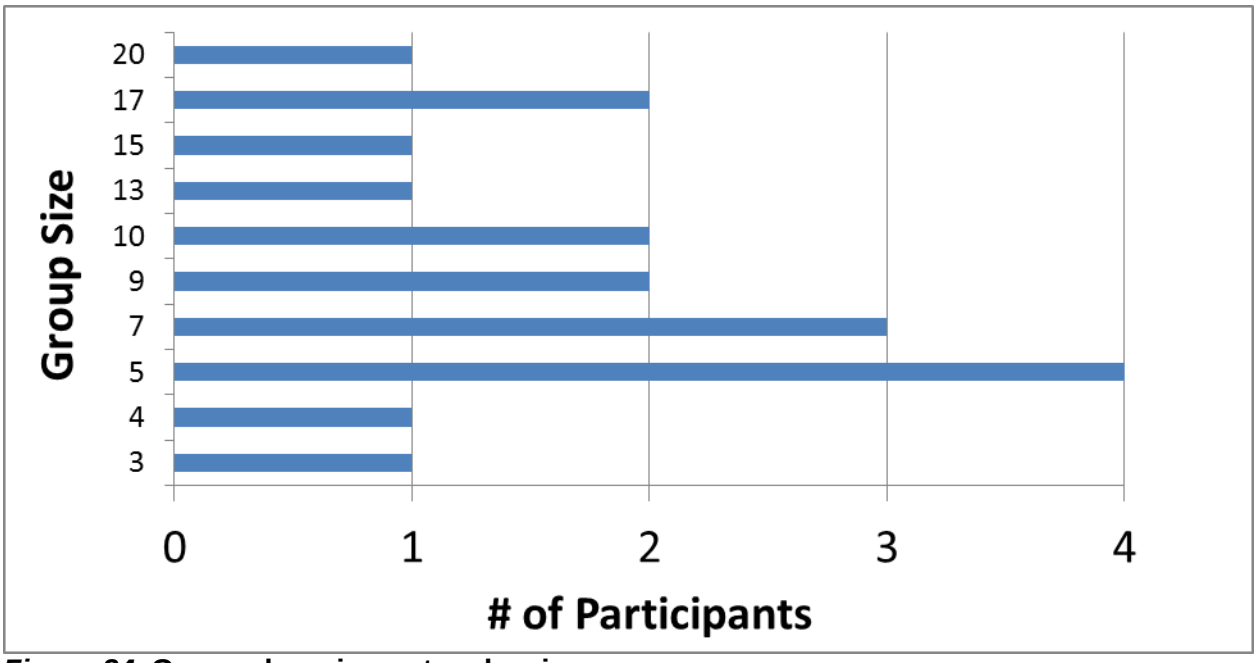

Figure 24. **Group-shopping networks size.**

6.1.2. Network Makeup

In the sharing activity, participants either drew their sharing networks in groups or wrote labels such as "family"; or, participants would just simply list the names of actual people then describe their relationships. The division of participants per network groups is illustrated in *Figure 25*. For example, 37% of participants illustrated on their sharing map that they shared with an acquaintance.

Figure 25 shows, across all participants, shopping networks included a mix of family members (included by 17 people), coworkers (included by five people), friends (by eighteen people), or acquaintances (by seven people). A little more than half of participants had networks predominantly formed with just family and friends, and a little under half focused on acquaintances.

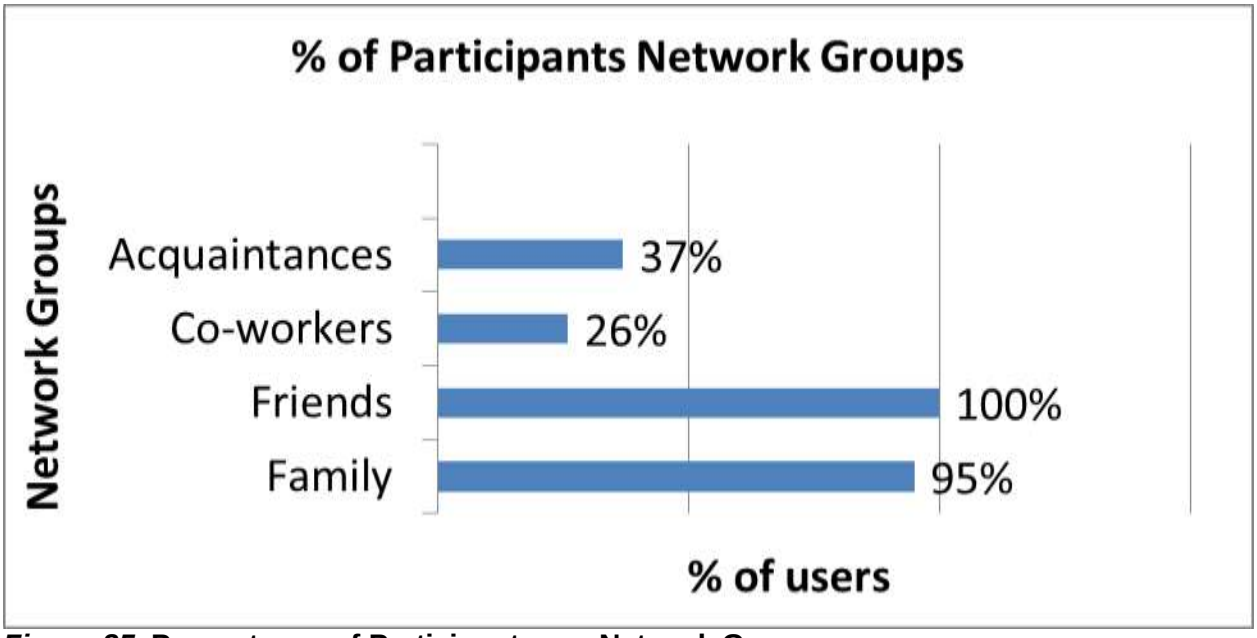

Figure 25. **Percentages of Participants per Network Groups**

I noticed that each participant had a core network of people with whom they frequently shared deals. At times, they would infrequently share with others who might be considered extended friends or they might occasionally post to an online forum of strangers. But, generally speaking, social shopping networks contained those people with whom participants had a close relationship.

> I'm more likely to say directly to a girlfriend "hey you were looking for this so here it is," but with guy friends just something if I think it's cool like really good price on some martial art classes or when they put up a coupon for the gun range I'll just post it on the wall on Facebook if anyone's interested they would just happen to stumble on it. —P1

In some instances people would be a little more aggressive and tag individuals who they wanted to see the post. For example, Figure 26 shows a user posting a Groupon for a boat rental. If a user wanted to specifically get another user's attention they would tag the user in the text section of the post.

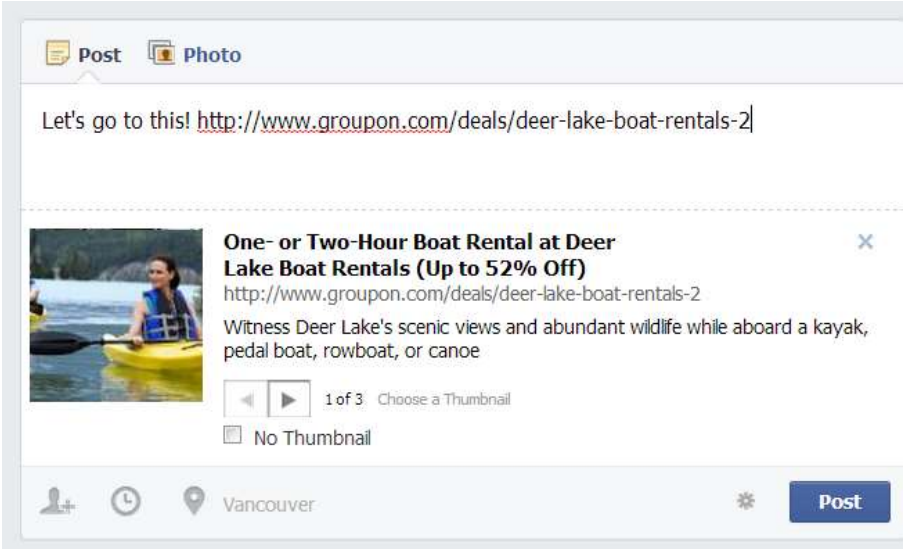

Figure 26. **a Facebook user sharing a Groupon deal.**

> I did tag two people on [my wall post]. For [a music festival], I did that just to see if anyone wants to go. —P9

Throughout the remainder of the results, I will refer to one's shopping network as the core group of individuals with whom they shared and occasionally point out how participants went beyond their group. Overall, the most surprising part of network composition was that participants easily defined with whom they shared. When questioned about people who were left off the map, participants either indicated they could not think of an instance when they would share with anyone else or no one else was part of their network; these occasional recipients were described as "one-offs."

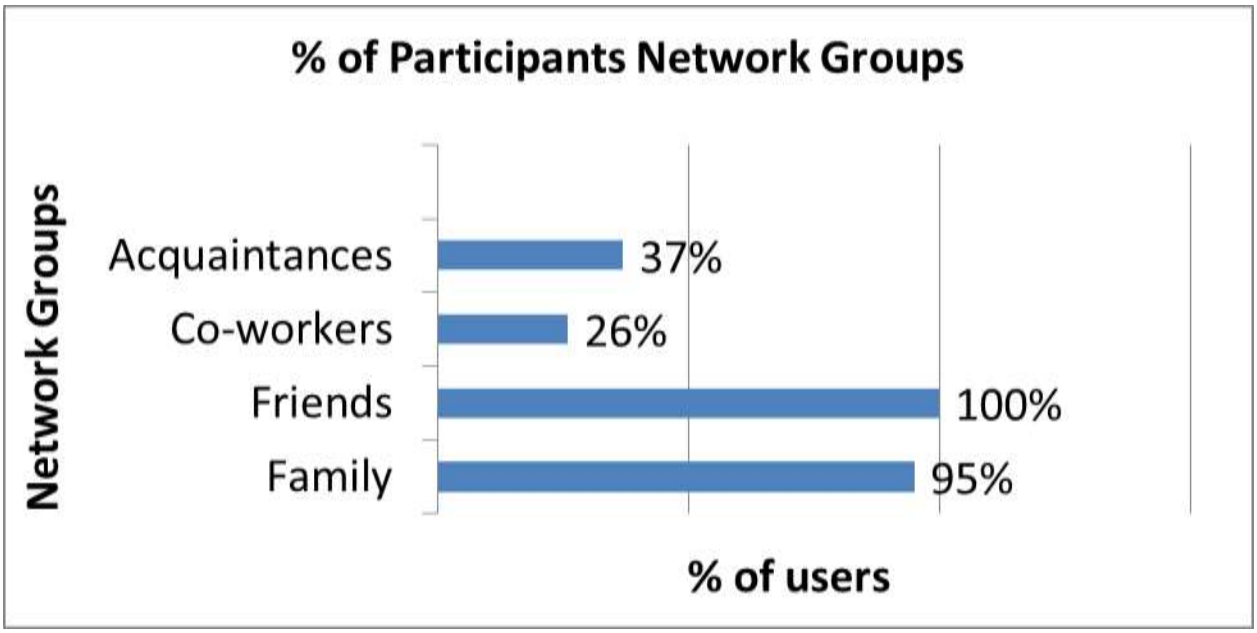

Figure 27. **Group networks composition.**

6.2. Sharing Routines

In their social shopping networks, participants had distinct ways in which they shared with others. These ways related to their perceptions about what deals others would like to know about, as well as knowledge of the routines of others. I also saw dynamics based on how participants "placed" themselves in their network (e.g., centrally or not).

6.2.1. The Matching and Mismatching of Shopping Interests

First, it was clear that participants shared shopping deals most with people who had similar interests and goals for shopping and activities, as perceived by participants. Thus, their shopping network consisted of people who were "like them" and this reflected on the shopping deals where they assumed others had similar interests.

> [Who I share with the most] would be a tie between these two people R. and S. They're both probably the most similar to me in terms of always wanting to try new things. —P6

When participants were asked if they had sent any shares (forwarded information about deals) that might be regarded as spam or misaligned to their network, they emphatically denied this could be the case. That is, no participants believed that the sharing of group-shopping deals would ever be considered a negative experience to the recipient of the sharing. Further, they

would describe the intimate knowledge of recipients' routines and activities to *prove* that group-shopping deals they shared would be well received by the recipient.

> I obviously know my friends and my family really well and if I think that they like it then I send it to them. —P10

Despite their assertion that *they* had never shared items that others would not like, participants talked about situations when someone in their shopping network had shared a deal with *them* but it was not actually of interest. They described this as a negative experience.

> It was my best friend from high school, [she shared a deal with me for] American Apparel. I don't shop there but she does. —P3

Although some participants mentioned it was probably an oversight on their friend's part, some did indicate it would affect their online shopping relationship going forward. For example, in P17's case, when asked if anyone had ever considered anything anyone ever sent as spam, P17 indicated the participant's mom's shares were not desirable and would now ignore her shares.

> [My mom] sends me lots of silly things so I don't really pay attention [to them]. —P17

Only one participant reported having shared or been shared something where the sender's goal was to get a cheaper deal for *the sharer* (rather than the shopping network). Thus, people remarkably had the interest of the network in mind when sharing shopping deals and purposely tried to share in a way that might help others, rather than just themselves. This relates to impression management, which I discuss later. The results also showed that the number of reported negative experiences related to deal sharing was small, but they did occur. In these cases, there was a mismatch between what people thought others would find valuable, which is hard for the sender to realize.

6.2.2. Hubs vs. Clubs

Participants were not only certain of the groups in the network with which they shared, they were also sure of the role they played in those groups. This assurance relates to the amount they shared with others and the ways in which sharing occurred among network members. Two types of user groups clearly emerged in the data.

6.2.2.1 Unbalanced Sharing

The majority of the users (twelve participants) classified themselves as participating in unbalanced sharing. This meant they sent out more deals then they received. These participants described themselves as a being a “hub,” or “that type of person who brings everyone together.” Figure 28 shows what a hub social-shopping network might look like. In these types of social-shopping groups, a main user is responsible for sharing information to other users.

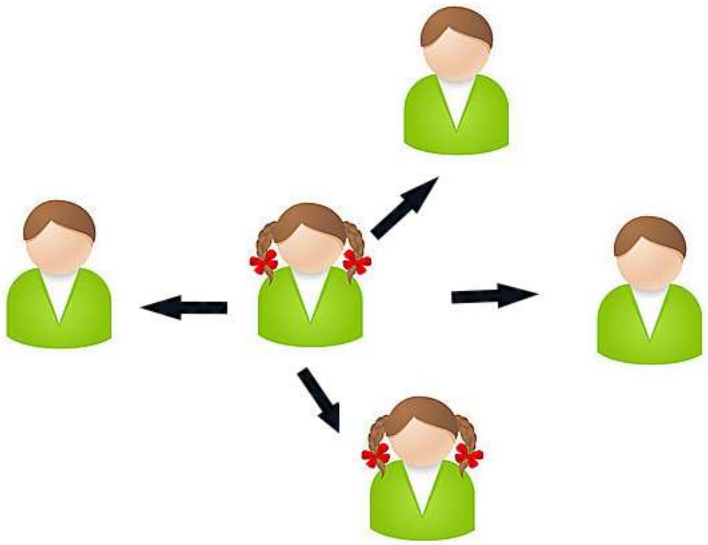

Figure 28. **Unbalanced hub shopping—“do-gooders” (63%).**

> I probably send more information out than I get in but that’s like me. ... Maybe like three to one ratio. —P10
>
> Usually its one-way thing, I mean I don’t have lot of friends who participate in online coupon things so there are maybe two other die-hards who will post on their Facebook wall. —P1

6.2.2.2 Balanced Sharing

The other seven participants described themselves as sharing equally with others in their shopping network. These participants described the activity of sharing as part of a club or partnership and occurred in one of two ways. First, there were those participants who had a balanced relationship and were essentially in a partnership of two, such that they would have a “shopping buddy.” They would most often shop with this person and it was reciprocated. Figure

29 illustrates what a balanced shopping club might look like. As described, all users had relatively balanced sharing in their social group.

> She gets everything. Every time I buy something. She is probably one of my closest friends. She gets cooking, she gets products, she gets restaurants and she gets travel deals. —P2

Second, there were some participants who were part of close-knit shopping networks with more than two people. Here, again, sharing was balanced among the network.

> I have three main people who we e-mail back and forth in terms of "did you see today's deals and did you check this out?" —P11

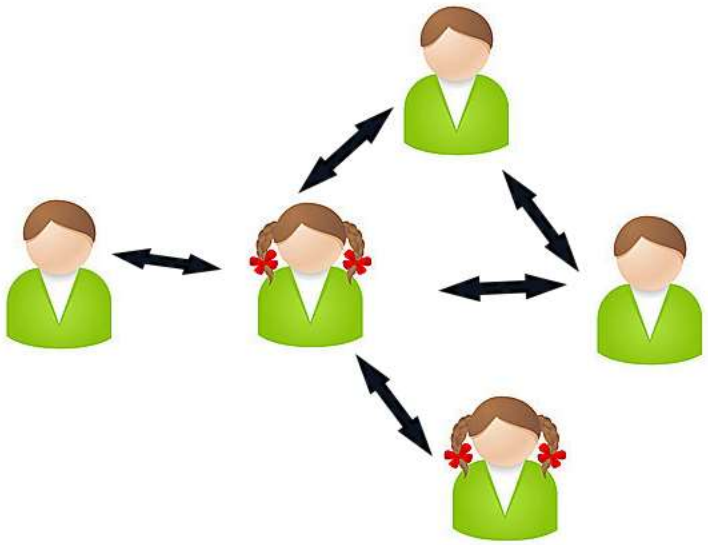

Figure 29. **Balanced club shopping—"shopping buddies" (37%).**

6.2.3. Mediums Used for Sharing

Participants shared deals with others using a variety of technological mediums. As illustrated in *Figure 30.* Mediums used for sharing. Nine people said they shared using Facebook wall posts, nineteen people said they used e-mail, nine people said they called people, five people said they sent text messages, four people said they used an instant-message service (e.g., Facebook Messenger, Skype, or Google Chat) and two people indicated they would talk to someone face-to-face.

Participants, again, talked about having intimate knowledge of the routines of their recipients. This time they described knowing what technology the recipient would use most often or would represent the best way to reach this person. Deals would be forwarded or sent to the person using this preferred medium. Participants also talked about these mediums in terms of the comfort level the recipient would find in them. This relates to topics such as privacy, such as where other friends of the person may also see the deal and potentially judge them.

> He uses Facebook a lot and posts a lot on his wall, so I knew he would be comfortable with that and I felt it was really fast way for him to see it. —P6

> Depends on their own lives—my mom doesn't she is not [into] computers; she does not have a computer or anything like that. Sometimes I'll send it to my brother to pass it onto her but [I might] phone directly to her so that's there is no 3rd party involved, sometimes family members can interfere and not send an message and stuff so I'll phone her directly. —P16

E-mail was often described as the easiest way to communicate and facilitate social activities. Participants would forward deals or copy and paste a link into the e-mail; these e-mails were often triggered by the daily e-mails sent by group-shopping sites.

> He forwarded it to me via e-mail. It is probably easiest to forward, and literally he is a lazy [guy], so it was probably just ease. I forwarded [mine] via e-mail. [I am] lazy too. Because I get them on my e-mail and just press forward and send it. —P19

However, some participants said that when excitement for the deal or urgency was high, they would turn to a more synchronous form of communication for instant responses—the phone. For example, this often occurred when the deadline for a deal was drawing close.

> Well occasionally we actually phone each other … like if she tries to e-mail and I don't get back within certain period of time she'll just phone me [and say] "have you checked your e-mail? What do you think, I'm just going to buy this right now?" Sometimes we do the buy for a friend so she is like, "heads-up, are you interested in this? I'll just buy one for you." —P11

> If it was deal that I thought he would really like I would either call him at work or text message him. —P1

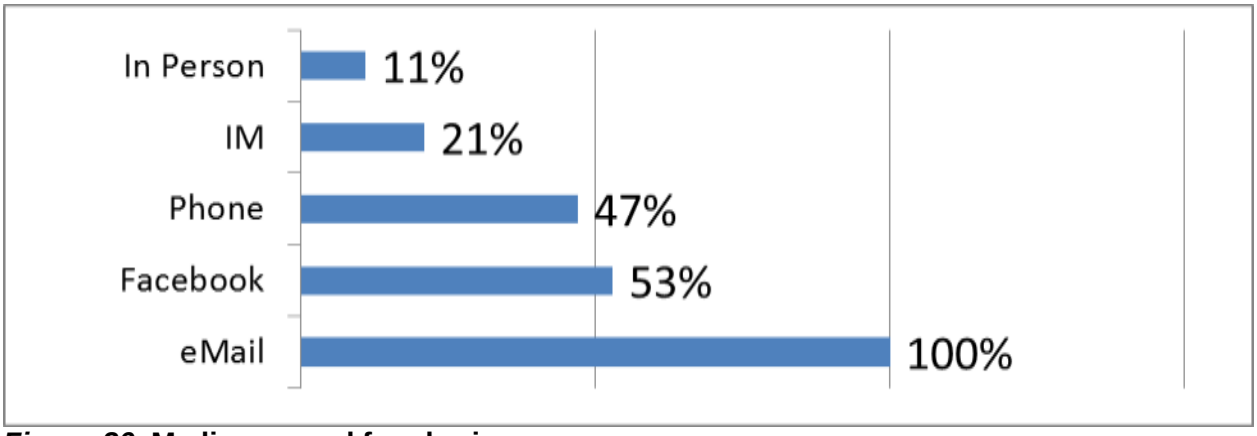

Figure 30. **Mediums used for sharing.**

6.3. Sharing Purposes

Given the results thus far, as well as my intuition, the expectation was that the purposes behind participants' network shopping efforts would be to first and foremost purchase products at reduced prices. Yet, when I analyzed participants' responses about their motivations and goals more deeply, I found it most surprising that group-shopping sites were doing more than just supporting shopping. Instead, they were more deeply supporting social activities. These activities reached beyond what one might expect and revealed an underlying purpose, which played a significant social role in these users' social lives. Here I found three "social" sharing purposes: event planning, building friendships, and identity construction.

6.3.1. Social-Event Planning

I found that social-event planning was the most apparent form of social activity being supported by group shopping. *Every* participant described at least one instance of social planning that related to their shopping and many described a large number of these. That is, participants were trying to plan activities and events with the people in their shopping network by sharing a shopping deal. Activities included planning lunch dates with coworkers, attending music concerts, and shopping offline together (by sharing clothing vouchers). People also tried to suggest or plan trips with others by sharing deals related to traveling. This included whitewater rafting trips, "booze cruises," and trips halfway around the world:

> I send it to them and say "hey, any interest in going out for dinner? Here is a Groupon." —P19

> I shared it with a friend that was coming into town and couple of my friends on here as it was cruise thing and that was quite recently. It was like a wine tasting thing like 3-hour cruises. I thought they would want to do it with me because they are Brits too so it thought it would be good thing for us to do to explore. —P13

I was surprised to hear participants describe their decision process for buying items. Here they predominantly talked about whether the activity would be good socially and very rarely, if ever, did they think about the cost of the item or whether it was a good deal. Their focus was nearly always on the social nature of the activity. Thus, social shopping sites removed any perceived risks associated with the purchase (by making the cost small), thereby allowing users to spend less time worrying about the actual shopping purchase and more about how they would partake in the actual activity.

6.3.2. Building Friendships

I also found that a large number of participants shared deals to build new or existing friendships. I saw examples of this earlier when participants would post open invites on their Facebook wall and share deals with people outside their normal shopping group. Participants also reflected on how group-shopping sites had changed their relationships and their social lives. For example, this included thinking about whether the interactivity brought them "closer" to their friends:

> I am a lot more social … in the whole scheme of things [on] the Groupon sites. They are great and I like them a lot and I think they are great way to make your own social circle. Especially for me I was bit withdrawn before. I don't, I wasn't one of these people—I'm really not social but then when I started having things to talk about or to share with people, then this is really easy, right? —P16

> It has definitely brought us all closer together. … We are trying out different places … and doing things that you would necessarily think to do. —P11

Although participants would mention the low cost of the items being a very real component to their interest in the service, the deals really seemed to allow them to not worry about money and focus on the social implications of their shopping and purchasing.

> It has dramatically changed my social life for sure. I was recently laid off at work. … Without these deals I wouldn't be able to eat out at all. I actually have a social life. —P11

> We did this weightless thing, it was so cool and it was something we would have never done, but it was half price and it was one of our birthdays. … We are trying different things so I think it allows you also get out of your little comfort zone a bit because—you are thinking—that's so cheap and I always wanted to learn how to do that. —P11

6.3.3. Identity Construction

Participants also very clearly used the sharing of deals to present, create, and construct a preferred identity for themselves. While participating in the sharing of these deals, participants were very aware of the image they were projecting. Participants described their acts of sharing as an extension of not only their online identities but also their offline ones as well. For example, P7 described enjoying forwarding Groupon e-mails because the clean aesthetic of the e-mail reflects well on the participant:

> The nice thing about Groupon is it has good colour schematics, good presentation; you don't feel like you are forwarding, for example, lame jokes. —P7

Other participants talked about network shopping being a way to further project their desired social role. This might include being a network leader, a particular type of person (e.g., nerd), or having general personality attributes (e.g., being "cool").

> To be honest I am the nerdier guy, so I'm sending the deals out; not lot of people are sending me deals. —P4

> I'm a manager so I am always looking at any kind of Groupon … for anything like paintball outings, go-kart outings that can be fun as a group, that kind of thing. … [I] look like the cool guy. —P15

Several participants talked about being helpful people. In these cases, the sharing of deals was seen as increasing one's social value in the network or among friends. For example, one participant described posting fitness membership deals and a running shoe deal on a Facebook running group of which the participant was part. The participant indicated the goal was to "help out" other members of the network. Several participants described similar incidents:

> I told them they can take bartending course for $39 and got really positive feedback —P4

> I share because … it is like that old idiom, "shared joy is double joy." —P12

6.4. Challenges and Improvements

Participants also expressed concerns spanning a variety of topics related to group shopping. First, some participants expressed concern over the privacy of their friends' e-mail addresses when sharing in a group-shopping site.

> I want to be helping my friends, not signing them for a service that they curse me for. —P12

Second, participants told us that the time limit of deals became problematic because of indecision or a lack of knowledge as to how many people had received the deal, or were going to purchase the deal.

> [Sometimes] there is too many of us trying to decide, so we won't book it, because we just forget about it." —P13

> [My partner] wants to do [the activity deals] all the time. So when I see them I forward them off to him and say, "want to get the guys together," but that has yet to happen. But [my partner] doesn't forward it on to his buddies, because he is lazy. … We also get busy and forget, and they are usually expired by that point. —P19

Third, many participants said deals often did not match areas of their interest. These related to the deals sent to them directly by the group-shopping websites.

> If it was more that I would be interested in, because some of them are not relevant to my friendship circle or the people I know they would not like it so I wouldn't bother. —P13

Participants were asked if they had any improvements they would suggest for group-shopping sites to make them more useful. Some participants expressed a need for a contact list so they could easily select the people with whom they wanted to share the deal.

> If each of these sites you could program a list of your contacts in there and then when you go check your vouchers you could just click on these people and just automatically send them the link that would be great. —P11

A few mentioned they would like to know what their network was looking for so they could tailor it to their needs. One participant mentioned desiring to be able to suggest deals and have better search functionality based on a tagging system.

6.5. Discussion

In this section, I summarize the study findings, compare them to the related work, and make design suggestions.

6.5.1. Network Awareness and Sharing

First, the results showed that shopping networks were small, well known, and typically comprised of people with close relationships. Group shoppers also knew about their family and friends' technical infrastructure and preference for technologies when it came to choosing a medium to facilitate communication. Communication mediums ranged from e-mail to Facebook and even face-to-face communication. The latter is similar to Ahmet and Matilla's (2012) finding that the majority of mobile app recommendations were the result of face-to-face communication. These findings also align closely with prior research on family communication more generally. For example, Tee et al. (2009) reported that extended family members—people who are related but do not live in the same household—knew a lot about their extended family members' technical infrastructure and preference for technologies when it came to choosing communication mediums. Neustaedter et al. (2006) found that people have a range of needs for staying in touch with family and friends and articulated this into two broad clusters of contacts: those where a strong need of awareness was required, and the second, where the need was described as "more discretionary" (Neustaedter et al., 2006). I also saw this in the findings where participants had a close group of friends in their shopping network, in addition to a more discretionary group with which they shared inconsistently and described as being "outside of the group."

6.5.2. Social Activities and Behaviours

Overall, I found that group-shopping sites were predominantly used to support social activities among individuals in a friend network. Because users employed a variety of different mediums and tools to connect socially (e.g., phone, e-mail, instant messenger, and Facebook), I suggest equally diverse design implications to aid in communication.

First, the findings showed users need to organize the planning of events and remember deadlines for buying and use. I thus recommend that users be able to easily add these key event dates and times into existing online calendars to remind themselves. If users are avid, they may even appreciate a calendar system on a group-shopping site.

Second, users at times preferred to use e-mail to communicate with their groups. Therefore, I suggest that features that allow e-mailing one's friends be incorporated into group-shopping sites. For example, some participants suggested being able to import contacts from various e-mail accounts into group-shopping sites. In conjunction, a user interface could be

created, to allow the tagging and creation of saveable grouping and distribution information specific to each user's shopping network. Not all may want such features because of privacy issues; however, certain individuals would value them.

Third, the results showed that users at times preferred the intimacy and immediacy of phone calls and SMS when communicating with their groups. If group-shopping sites are being designed for mobile devices, the mobile apps or web pages could feature ways to easily call a user in one's shopping network, automatically populate an SMS message to send them with deal information, or even send a calendar invite based on the deal.

Finally—and perhaps the medium with the greatest synergy—is on social-media sites. The findings about usage and sharing are similar to those found in recent studies describing how people use Facebook to maintain an awareness of their friends' activities through location (Barkhuus et al., 2008), coordinate offline socialization (Barkhuus & Tashiro, 2010), and build relationships (Joinson, 2008, Lampe et al, 2008). Yet despite these usage parallels, most group-shopping sites did not contain many features to support such activities well.

I believe that group-shopping sites can benefit from similar design implications suggested by Barkhuus et al. (2010) and by Joinson (2008), by including features that integrate existing friend networks (e.g., e-mail contacts or social-media friends). Such features would allow users to maintain interactions with their shopping network, allow friends to follow-up on their shared interactions, and provide the user the ability to reflect back on past social commerce experiences. Users should also be given the ability to easily send out invitations for deals and organize their friend "circles." This study showed that shopping networks consisted of well-defined (e.g., family, friends, and coworkers), consistent sizes, and consistent sharing practices (Hubs vs. Clubs). Social-media models that support the clustering of contacts into a small group (e.g., Google+) would fit nicely with group-shopping sites.

Social networks, such as these, also have preexisting data with detailed network contexts and these data can easily be used to create dynamic contact lists that already have functionality to facilitate, and display feedback such as "likes," comments, and event RSVP systems. The ability to provide feedback can help in the management of social identity and event planning.

This type of integration would also allow group-shopping sites to bring in other contextual information that might help remove misalignment of interests (e.g., sharing a deal

that someone is not of interest). If users knew their friends liked particular services or products because they posted about them on a social-networking site, this information could inform their recommendation or improve alignment. One could also think about strategies beyond this, where the act of using a “social login” or a site that shares activity information with friends might also support recommendations. For example, Ticketmaster has recently introduced a service that allows people to see the seats their “Facebook friends” have purchased, so they can plan for the event accordingly. This example of using social data with a shopping experience is an excellent example of a way to use social login when shopping.

6.5.3. Hedonic Motives and Impression Management

Results showed that shopping in an online network can go beyond hedonic motivations, which include the pleasure of shopping. “Role shopping” (Babin et al., 1994) or “role playing,” identified by Tauber (1972), is when one uses shopping to present and construct a particular identity. Thus, even though the goal of group-shopping sites is to get people to buy items, people also use the site to project a particular identity. Goffman (1959) defined identity from a sociological perspective as the mental model people have of themselves. According to Goffman, identity is a performance by an “actor” to an “audience” (e.g., those observing), which is aided by other “cast members” (e.g., friends and colleagues) who help establish and maintain one’s identity.

Currently, group-shopping users who participate in impression management have few ways to control their image or track the results of their presentation. Getting feedback of whether a friend purchased based on a recommendation or, more specifically, what they thought of a recommendation, is imperative in developing this connection. Using Goffman’s (1959) terms, first, current tools provided in group-shopping sites do not allow the “actor” to provide awareness to either the “cast” or “audience” of the constructed identity. By this I mean that the actor (or user) must use other tools to share deals. The only people that see these are the direct recipients, or the cast. The larger audience with which the actor may want to share this “identity,” the larger social network, does not see it because the communication is outside of a larger social-networking system. This takes away the ability for an audience to even partake—via surveillance or any other means—of the user’s activity. It also means that the cast has few ways to engage with the actor in reply to this sharing, which limits the feedback the actor can receive about this constructed identity. By more closely linking one’s group-shopping activities

with social-networking features, users could more easily engage in all aspects of impression management and also provide the ability for users to look back at their commercial activities.

There is a risk that providing social-networking tools on group-shopping sites may pose privacy issues for some individuals. That is, some people may feel they are more “on display,” which in turn might cause privacy issues for users if group-shopping sites are linked with large networks of their friends. Some users might also have concerns about companies tracking their usage. In these situations, it is of utmost importance that users are able to regulate who within their social network sees their shopping activities, such that they can further regulate how their identity is presented to their friends and family.

Results on impression management are similar to those of other studies that found people similarly trying to construct a particular identity, even though the systems being studied were not meant for identity construction per se. For example, Voida et al. (2005) found users in a workgroup setting felt pressure to adapt to office norms and participate in iTunes music sharing when they saw other coworkers participating (Voida et al., 2005). People made use of iTunes as “an explicit mechanism of awareness” such that the system would inform the office of the locations of users and help to establish impressions (Voida et al., 2005). These results suggest, as does the Voida et al. work, that users use nonsocial applications to aid in the construction and presentation of one’s identity, whether or not they are built for it.

Similar to the Voida et al. (2005) study—with a different goal—Sadeh et al. (2009) uncovered surprising results when they completed a study focused on understanding users’ attitudes toward privacy when they interacted with location-sharing mobile applications. Results showed that even though the site was not intended for it, people used the application as a social-awareness and engagement tool.

Although this study focused on group-shopping sites in particular, I believe that it studies are beginning to reveal a larger social phenomenon that is occurring in technology usage: As people become more familiar with social-networking sites, they begin to expect such features to be included in a broader set of technologies. Moreover, their practices with social-networking sites extend beyond these sites and, if the sites do not support these behaviours, people find alternative ways to achieve them. Considering how people have adopted social-networking sites such as Facebook, it is not surprising to see that people are using and have expectations to use

others sites as social tools. This is a hypothesis at best and future work should continue to explore such changing social expectations.

6.6. Summary

In summary, this study explored how users shop online through group-shopping sites. The main finding is that group shopping is about the social experience, and not merely about shopping. Yet group-shopping sites are not designed for all of the social behaviours revealed in this paper. These outcomes suggest that group-shopping site designs should be augmented.

What is most interesting about the user behaviours I uncovered is that unlike the social-networking sites studied in the past (e.g., Facebook), these interactions are originating from a commercial application where shopping is assumed to be the primary purpose of activity and communication is conducted throughout a variety of systems that are not part of the shopping sites (e.g., e-mail or Facebook). By working in alternative ways, users are instilling their social-media preferences about communication and social focus to other sites in different contexts. Moreover, the “good deals” lend themselves to this by creating a low-risk mentality among users. These low costs allow users to put aside the logical aspect of shopping and focus mostly on the social experiences they gain by participating in group shopping. These results reveals a variety of opportunities for technology design where features found on social-networking sites may begin to be incorporated in group-shopping sites to improve user experiences. I explore such ideas in Chapter 9 of this dissertation, where I triangulate the findings from all three studies to discuss design implications. In the next two chapters, I describe the third and final study of this dissertation, which focuses on mobile payment systems.

Chapter 7. Mobile Payment Study Methodology

This chapter presents a detailed description of the methods, data collection, and analysis used in the third study of this dissertation. The goal of the study was to understand motivations, behaviours, and first impressions of mobile payment users in North America. To address this topic, I investigated two main groups of participants through interviews: those who currently use an mobile payment, and those who do not. Selecting these two groups allowed me to compare users who were already very familiar with mobile payment, as well as an authentic account of those trying a service for the first time. This study directly maps to the third research objective, which was to i*nvestigate mobile payment users' practices, motivations, how they mitigate trust, and their successes and challenges in the mobile payment space.*

The study included several forms of mobile-payment styles currently available in North America. Specifically, these included *Carrier Billing* (e.g., Text2Pay) in which the consumer pays by text message and the charge is added to their phone bill; NFC (e.g., Google Wallet), in which the consumer can pay at the point of sale by waving their phone in front of a terminal; *Closed Loop Mobile Payments* (e.g., Starbucks App) in which the consumer uses an app on their smartphone to pay, typically by scanning a barcode at the register; and *Card Readers* (e.g., Square) in which merchants take payment via a card reader attached to a smartphone or tablet.

7.1. Participants

I recruited 21 participants (11 female, 10 male) through postings on online forums and word of mouth. Ages ranged from 21 to 49, with a median age of 27. All participants lived in major metropolitan cities in North America (Canada and the United States). Occupations of participants varied heavily, e.g., engineer, graphic designer, social worker, student, web developer. Participants had average to expert technical abilities and all owned a smartphone. About half of the participants used an iPhone, while the other half used an Android device.

I chose to investigate two groups of participants: existing mobile payment users and new mobile payment users. This allowed me to understand the experience from the perspective of

those who have had relative success with mobile payments, leading to their repeated usage or long term adoption, as well as the first impressions of new users who may or may not chose to adopt the technology for longer term usage. Based on their own descriptions, I classified eleven users as *existing users* and ten participants as *new users* who had never tried a mobile payment system prior to the study. The amount of experience that existing users had in using mobile payments varied between two weeks and four years with a median of ~6 months. Existing users used mobile payments on average two times per week.

I purposely recruited participants with a wide range of ages, occupations, and mobile payment systems so results would be more generalizable to the general population not a specific demographic or mobile payment system. Further, in this study the recruited of non-users as a participant type was important as in Study 1 all participants were frequent users of mCommerce. For the final study, in this body of work, understanding the user experience of new users was valuable and necessary to gain a more complete understanding of the ubi-commerce experience.

7.2. Method

As described earlier, my study method varied depending on whether a participant was an existing user or new user of mobile payment. Below I outline the methods used for each user type.

7.2.1. Method 1: Existing Users of Mobile Payment

Existing users participated in a semi structured interview that focused on their past and current experiences with mobile payment systems. Interview questions were based on understanding the participant's specific instances of use and why they used the services the way they did. Sample questions included: What mobile payment system have you used? When was the first time you used a mobile payment system and why? When was the last item you purchased using a mobile payment and why did you choose this payment method over another? What time of day was the purchase made and why? The questions were designed to understand the history of these existing users' experiences with mobile payment. Further they

focused on specific examples to help the participant tell detailed stories. Interviews usually lasted between thirty and sixty minutes.

7.2.2. Method 2: New Users of Mobile Payment

After the data collection of Method 1 was complete, ten new users, who had not used mobile payments before, were asked to complete an e-diary over a two-week period while trying out any mobile payment system(s) of their choosing. The diary method was chosen specifically to capture the user's experience in-the-moment over the first two weeks of use. During the two weeks, participants were asked to complete a minimum of four diary entries though I anticipated that some participants may not complete this requirement if they simply found mobile payments too difficult to use or it did not meet their routines. A diary entry was required for every instance of purchasing that they attempted. The four diary entry minimum was chosen as four was the average number of completed transactions by existing users in Method 1 over a two week period.

As illustrated in Figure 31, the diary entry was a web form which had fields asking the participants for the following information: title of the activity, date, time and location of the purchase, if they had any trust concerns when completing this activity, why they used a mobile payment and not cash/credit/debit, a summary of the purchase, and their satisfaction level of the experience. Participants were told to complete the diaries as soon as possible after the purchase. This could be done on their phones in the moment, or later in the evening when at home. Participants opted to do a range of behaviours for recording entries.

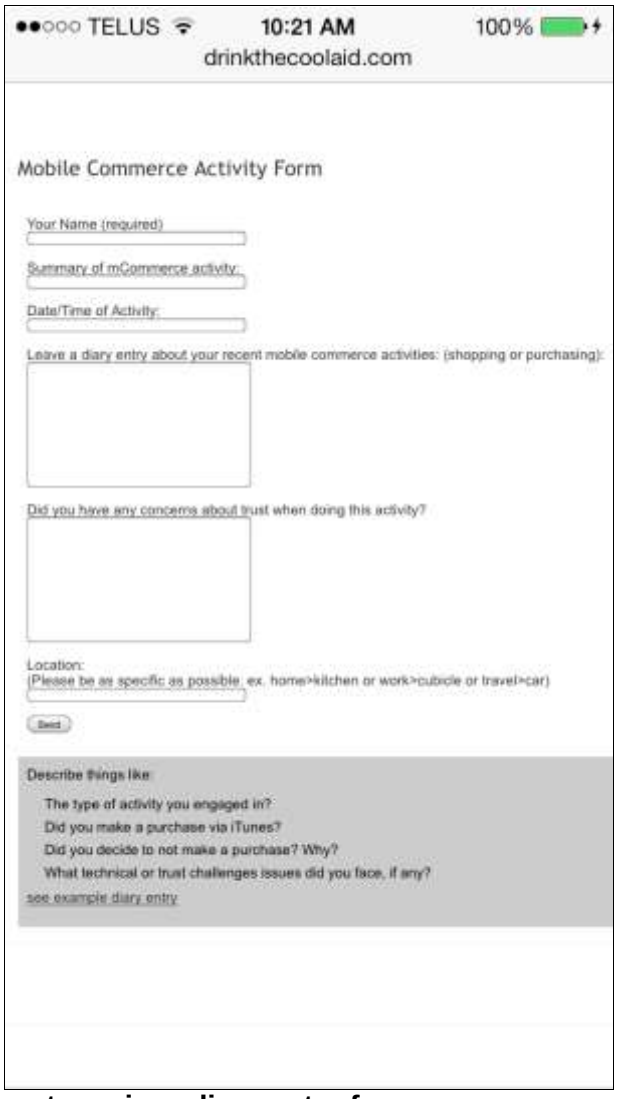

Figure 31. **Mobile-payment services diary-entry form.**

After participants completed the diary entry phase, they participated in a semi structured interview. During the interview, which also took between thirty and sixty minutes, participants were asked to review each of their diary entries and expand and/or clarify their entries. After, they were asked questions about the overall experience.

Existing users did not complete diary entries as we were interested in their summative experiences across their entire experience of using mobile payments, rather than a small portion of time, which would have been captured by diaries.

Participants used a variety of mobile payment options. These fell into one of four categories based on the types of mobile payment methods available in North America:

1. ***Closed Loop Mobile Payments*** (e.g., Starbucks App): the consumer uses an app on their smartphone to pay- typically by scanning a barcode at the register (7 new users, 7 existing users).

2. ***Carrier Billing*** (e.g., Text2Pay): the consumer pays by text message and the charge is added to their phone bill (1 new user, 2 existing users).

3. ***Card Readers*** (e.g., Square): these solutions allow merchants to take payment via a card reader attached to a smartphone or tablet (2 new users, 2 existing users).

4. ***Near-Field Communications*** (e.g., Google Wallet): the consumer can pay at the point of sale by waving their phone in front of a terminal (0 new users, 3 existing users).

Most users focused on closed loop payments given that they are currently more widely available in North America. The skew of new users to closed loop payments (e.g., Starbucks app) speaks to what participants were comfortable using mobile payments for and the monetary value and potential risk during the start of their usage. Because our participants used a variety of mobile payment systems, our study reveals behaviors across a range of mobile payment options rather than findings specifically on any one payment solution. Despite this diversity, my results are fairly homogenous around all of the mobile payment systems that participants used. I also feel this allowed us to explore the mobile payment research space as a whole, rather than a targeted study of just one type of payment option.

7.3. Data Collection and Analysis

Similar to Study 1 and 2, I recorded and transcribed audio recordings for all portions of the study. This was done holistically rather than separately for each different research question. Each user group was first analyzed separately. I then reviewed the data from both groups together to compare and contrast experiences. Combined with the transcripts for each group was a participant summary I wrote out after their interview, as well as detailed interview notes, demographics and for the new users their diary entries. These transcripts were then analyzed using open, axial, and selective coding to draw out the main themes and compare these findings across participants. This specifically involved me reviewing printed out transcripts, then hand writing codes on common themes. For example, codes that emerged from this study around adoption included: [fr] friends, [eou] ease-of-use, and [gm] gamification. After all

transcripts were coded out, I then put all the participants' comments into a spread sheet with their assigned codes. I then went line by line grouping codes into categories by using affinity diagramming. This specifically involved me drawing out the categories and themes to get a visual representation of how the ideas flowed and represented the phenomena as a whole. This also allowed me to easily identify any overlapping ideas and/or misplaced categories and rearrange accordingly. Overall several main themes that relate to the success and challenges that many participants faced when using mobile payment systems, which included: trust building mechanisms or lack of, how they learned about the service, and shopping habits such as prepayment anxiety, and the effects of gamification and bystanders. These categories and themes identified through this process are discussed in the next chapter.

7.4. Summary

In summary, this chapter has provided a detailed review of Study 3's participant-recruitment strategy, participant demographics, the methods used and how the data were collected and analyzed. Similar to Study 1, the new-user participant group participated in semistructured interviews and recorded electronic diary entries throughout the test period. Because the focus of the existing-user participant group was on their past experiences and behaviours, a detailed semistructured interview was selected as a method.

In the next chapter, I outline the results from this study, focusing on several main themes found in the data, such as shopping and purchasing activities to describe what people commonly shop for and purchase, as well as when and from where people shop and why.

Chapter 8. User Routines of Mobile-Payment-System Users

This chapter reviews the findings in the third study of this dissertation, which focused on mobile payment. The results from this study answer the third research objective of this dissertation. This was performed by exploring key discussion points related to mental-model development, gamification and trust, to describe current challenges and successes with mobile payment in North America.

8.1. Purchasing Activities

Existing users reported a wide range of products and services that they purchased through mobile payment including coffee, clothes, sporting goods, electronics, bill payment, bank transfers to individuals, furniture, school tuition, and even paying for participation in a hockey pool. These products ranged in price from a $2 cup of coffee to approximately $3,000 for school tuition. More than 80% of existing users reported they used mobile payment at least once a week.

During the two weeks, new users purchased coffee and made bill payments and bank transfers to individuals. New users' product prices ranged from $2 to ~$150. Although I asked participants to complete four diary entries over the two weeks, participants completed an average of 2.3 entries. Three new users did not complete any transactions even though they tried or thought about paying; I followed up on these instances in the interviews. Without these three outliers, the average number of diary entries/purchases was 3.2. The maximum number of entries was four. This illustrates that mobile payment was an activity that typically occurred a couple of times a week for new users. Thus, it was not a habitual or routine activity, which is to be expected for new usage when a person is still establishing a routine.

For these purchase activities and experiences, findings revealed participants had clear successes in mobile payment creating positive purchasing experiences. In addition, I also saw

clear challenges that mobile payment posed for participants. Thus the results focus on these two main sections.

8.2. User successes with Mobile Payment

Participants had a variety of successes using mobile payment. These focused on routines, ease-of-use and usefulness, gamification, regulatory avoidance, and social perception.

8.2.1. Habitual Routines

First, I found that mobile payment lent itself well to habitual purchases—purchases that were frequent and recurring. Participants who used mobile payment as part of habitual purchasing activities felt it worked well and they liked it because they could easily fit it in to their "routine." Participants explained these purchases, sometimes as explicit knowledge, whereas other times it appeared to comprise only a tacit understanding of their habitual routines.

About half of existing users reported they very clearly had a daily habitual routine when using their payment service. For example, when asked how often P6, a existing user, used mobile payment, the participant replied, "everyday." P6 then proceeded to describe the time of day, and variations based on a weekend and week schedule. Also, this participant described how this routine has made P6 a more loyal user.

> I rarely go to any other coffee shops [now]. … I've just got accustomed to Starbucks. —P6, existing user

Other existing users had similar comments about how much they liked mobile payment because it fit well into their routine:

> I have my cell phone already in my hand because I listen to a podcast every morning, all it is pause the podcast, get coffee. … Always the same time of day … 7:45 in the morning … on my way to work. —P4, existing user

This user also had similar thoughts about increased loyalty; P4 mentioned that the process was so "easy"; this participant frequented the store more often instead of going to a variety of stores. In other words, existing users increased their loyalty when they used mobile payment at a company, but this did not increase the frequency in which they made purchases. For example, if they purchased coffee once a day before using an mobile payment, they would

continue to purchase coffee once a day. However, what would change is that they would avoid stores that did not offer a mobile payment solution.

From a new-user perspective, P12 admitted the ease of integrating mobile payment into the “daily routine” and commented on being surprised it was so easy to integrate:

> I think how quickly I became accustomed to doing it. I just don’t even think about it anymore; [it’s] just how I pay for things now. —P12, new user

Five existing users had a semihabitual routine. Although these purchases were not daily and at a particular time of day, these users reported they made purchases at the same place in certain time intervals for recurring purchases. For example, this included utility bill payments, purchases of coffee a couple times a week, or tuition payments for school that were paid once each term.

Moreover, users suggested services for mobile payment were heavily related to transactions that were frequent and routine, such as gas purchases, bill payments and groceries. For example P6, a existing user, said they “wish” they could use mobile payment for gasoline purchases because they filled up every few days or so. P4, also a existing user, and P12, a new user, had similar thoughts about grocery-store purchases:

> I wish gas stations and grocery stores accepted mobile payment. —P4, existing user

> If my grocery store had it, that would be great. I would be reluctant to use an app like that in a place that I am not a regular patron. —P12, new user

Users also expressed disappointment when they tried to find ways to use mobile payment to pay their recurring monthly bills. For example P18, a new user, was unhappy that her power company did not have a mobile payment app:

> Another thing that was really surprising for me was that there was no app for paying your hydro bill because … [this is] important for me. —P18, new user

8.2.2. Ease-of-Use and Usefulness

Existing users and new adopters identified many motivations and benefits to using mobile payment. First, when asked for the benefits of using mobile payment, all existing users and new users mentioned ease of use, with no bias toward the type of mobile payment system. When asked to elaborate, responses mostly included two key elements: The process was *easy*

and *faster* than other payment methods. For example, P17, a new user, mentioned that the mobility and shortcut to make a bill payment allowed the participant to multitask while in a class:

> It was nice to actually be able to take care of [paying my bills] … when it popped into my head, I wasn't doing anything and I was able to [pay some bills], so I just pulled out my phone and did it. Which was kind of a new thing for me and I actually really liked that. It felt very productive too, to get something like that done; I felt like I accomplished something in class today. —P17, new user

Second, somewhat surprisingly, mobile payment made it so payment methods were more often ready at hand and available when needed at a store. For example, a number of existing users mentioned they often forgot their wallets but never their phones. In fact, these users described paying by phone as a more natural process than using their wallet.

> You always have your cell phone; I mean you forget your wallet nowadays way more than you do your cell phone. It is just easier to use. A lot of people have it in their pocket and it's just right there as opposed to … trying to get your wallet and everything and so it just makes everything easier, one little device. —P4, existing user

> It was just easier to have my phone out than take my wallet out and find a card. —P2, existing user

8.2.3. Gamification and Entertainment

Many mobile payment systems designed as phone apps provide gamification elements; where gamification is described as the use of game mechanics, such as achievement, status and competition, to engage users in non-game contexts. In systems such as the Starbuck app and Levelup, users can score points, advance to the next level, and receive rewards for purchases. The majority of users mentioned that they enjoyed the gamification of the mobile payment system they used. In fact, they would often describe the experience of purchasing as "more entertaining" and "funner" because of the gamification. For example, P12, a new user, described how enjoyable it was to see the stars from the Starbucks app "dropping in the cup," indicating she was getting closer to a free drink. This elevated the transactional experience compared to paying by credit card or cash. In this case, Starbucks has taken a desired action, buying Starbucks coffee, which is not normally game related and attached a game mechanism around collecting stars for rewards with every purchase. LevelUp also uses similar game mechanics, and while they are light and simple, it clearly has an added benefit for users. Some users also mentioned the gamification as a loyalty draw for them. In the example below, P11, a new user, discusses his first gamification experience through mobile payment:

> I think it is cool to be able to use my phone to [participate in gamification]. … I am probably more inclined to go to the deli that accepts LevelUp than other delis in my neighbourhood … more for the gamification. —P11, new user

8.2.4. Social Perception

A number of findings on social issues were also identified. These included how users felt about people watching them use the services and confidence using the mobile payment system. Overall, new users and existing users generally described the mobile payment experience as a positive social experience. Moreover, new users who did not enjoy mobile payments (three participants) did not describe the process as socially negative, despite their lack of usage.

Participants often described how they felt "cool" using a mobile payment system, how the efficiency of payment aided in a positive social experience, and to a lesser extent, how it helped them engage with their community. Users described being watched by other patrons and sometimes even engaged in a positive discussion around mobile payment with friends or customers during or after purchases. The ease of using mobile payment would also allow the users to make payments faster (than debit or credit) which helped the queue move faster, easing impatient employees and customers. For example, P21 talked about the experience of paying via mobile payment:

> [Other store patrons] like it because the line moves faster; you can see they are impatient if you are looking for cash or a lot of extra steps for [the employee] to key in a credit card purchase. —P21, existing user

Existing users generally described that many of their friends used the service. The majority also mentioned that mobile payment was becoming popular because it was a "topic of discussion" in their work or school environments. For them to appear they were "part of their community," they felt they should be able to comment on the new technology.

> There was this discussion in the community I am in. It definitely prompted [my mobile payment use] in that sense. … I know a lot of techies. … The community would be, I guess, the geek or techie community. —P3, existing user

8.2.5. Regulatory Avoidance

A number of participants also mentioned they used a form of mobile payment to get around regulatory restrictions from banks. Some examples included credit limitations, much like prepaid visas (e.g., PayPal); ordering gaming licenses from countries that did not accept the

user's local credit card information; and, making payments from consumer to consumer or small businesses, and charities collecting payments without a point-of-sale terminal from a bank (e.g., Square). For example, P1, an existing, used Square for business transactions, and did not have to set up a merchant account at a bank. Being able to accept credit cards as a small business has altered the way P1 sells merchandise. P1 described how mobile payment has allowed this participant to accept credit cards and thus expand the business.

It is well known that poor trust relations and fear between banks and patrons have helped drive developing countries' mobile payment success (Hinman & Matovu, 2010). Although North American banks systems do not have the same mistrust, these users still used mobile payment to avoid bank charges and regulations, however, the reported types of charges and regulations were specific to North America.

8.3. User Challenges with Mobile Payment

Like any new technology, users experienced challenges with mobile payment. In this section, I present the challenges users faced, focused on routines, lack of benefits, usability, privacy, lack of mental-model development, and prepurchase anxiety.

8.3.1. Routines and Lack of Benefits

For new users, the value of routines was still high. However, their view on how mobile payment fit into their routines and to what benefit varied. A major reason new users did not use the service was that it did not fit into their routines, thereby providing little benefit. As an example, P19 explained that the mobile payment systems did not fit the participant's purchasing routines:

> The Starbucks one is nice, it sounds quite cool but I don't use—I don't buy Starbucks often enough to use it. —P19, new user

This quotation signifies that mobile payment is currently only available in a small number of instances and stores in North America. For it to be readily used in Canada and the United States, mobile payment options must map to the specific stores or activities a person regularly uses. The quotation illustrates that people who use Starbucks can easily use mobile payment because Starbucks has a specific app. Yet people who might drink coffee at another location, such as Tim Horton's in Canada, will not have the same opportunities because the store they

routinely frequent does not support mobile payment. This suggests that, over time, if more stores adopt mobile payment as a payment option, the practices of new users might be different. New users often did not see the point of using a store “once in a while” simply so they could use a mobile payment system.

In addition to this, two of the three new users who did not enjoy using mobile payments did not see the benefits over a credit card, despite understanding how to use them. These users indicated, at the end of the trial period, that they thought they would not use mobile payment in the near future, but perhaps would give it a try if services fit their routines more in the future.

> I think [I would maybe use mobile payment in the future] because it could become more popular and we are moving towards that, maybe when my friends and family start using it and when it becomes a norm. —P19, new user

This viewpoint illustrates that people are often fairly engrained in their current payment methods. It suggests that unless there is a larger societal shift in payment options and usage, some people simply will not change their practices.

8.3.2. Usability Issues

Compared to Study 1, a larger number of user concerns emerged. These issues included growing pains of a new service and expanded to serious concerns about privacy and security. First, a number of usability issues were identified with the mobile payment systems participants used. Many participants indicated they did not know how much they were being charged, before or during the transaction. This was true for a number of payment methods (e.g., Starbucks app and Square). This was a key concern for them and was mentioned not only in their interviews but also in a couple of users’ diary entries. For example, P11, a new user, talked about the delay in being notified how much was just spent at a local deli:

> A few minutes later you get a message on your phone saying you just used LevelUp and the amount was X so it’s just for the split second when they punch in the number they put in and then they charge your phone [you don’t know how much you are being charged]. —P11, new user

A common theme across mobile payment was the lack of visual or audio indicators for feedback around transactional information. Users thought it was unclear when the transaction went through, as there was little indication, leaving them unsure if the transaction was complete.

This, in addition to lack of social cues from employees, led participants to feel concerned that they might have been charged twice for the purchase.

8.3.3. Trust: Security Breaches and Privacy Concerns

Three existing users reported having serious data concerns related to trust. P10, a existing user, explained that one mobile payment was tied to the user's e-mail account. The e-mail account was hacked, which P10 assumed compromised the participant's financial data. As a result, P10 no longer uses that particular mobile payment system, but still uses other systems.

P6, also aveteran existing user, explained a situation when using a pay-by-phone parking service for metered parking. P6 explained that the system was tied to one's phone number when the user calls in to pay and that P6 had just recently had the phone number changed. The system did not allow P6 to change the profile, which resulted in P6 having access to someone else's account. This, in turn, left P6 with the assumption that someone had access to P6's account too. The situation was "worrisome" and "a bit scary."

Another existing user reported having trust concerns about the security of paying through a barcode displayed on the phone. Because of this, the participants and participant's sister did a test, sending the sister a screenshot of the barcode. The sister then displayed the picture of the barcode at the store to make a purchase. To their surprise, the barcode scanned successfully at the store and the sister was able to purchase.

All user groups had trust concerns about security of the personal information they entered over Wi-Fi or other networks. For example, P20 had extreme concerns about the contract signed to use the Starbucks app, as well as little understanding about how the process would work. P20 even was concerned that the company might have access to all the data on the phone.

Users also had concerns about data on their screen being visible to outsiders. P8, an existing user, said,

> It has to do with money, it's kind of private, so then I try not to show anyone. —P8, existing user

P16, a new user, said she was nervous entering her credit card information on a bus.

> I found [a payment app] which I could add [money] to with a credit card … so I added $20 and paid with my card. I did it on the bus and I think that made me a little nervous, like, can anybody see me taking my card out? —P16, new user

8.3.4. Fragmented Mobile Payment Solutions

A few participants mentioned they did not like to leave money or personal information untouched and not regularly used. That is, they really disliked the idea of creating multiple accounts for each vendor they might use. Instead they wanted just a single global account. They believed having multiple accounts would increase the chances of them mishandling their money, perhaps forgetting about money in an account or not being able to keep track of all the account charges in cases of potential fraud. Participants specifically said they needed to "touch" their money often (e.g., by spending small amounts with each mobile payment system) to ease trust concerns and overall fear of money loss.

For example, P17, a new user, mentioned information saved in a PayPal account from years ago. P17 expressed concern about not regularly using the account and felt uneasy about having this information just "languishing" there for years. This consideration ultimately gave P17 a negative feeling about PayPal, mistrusting PayPal as a brand and the information that was stored with them.

Similarly, P19, a no adopter, would not use a system for payment unless it was accepted at nearly all stores the person frequented. P19, too, disliked the idea of having money in numerous places and was concerned this would lead to a loss of money as it

> just sits in an account somewhere. —P19, no adopter

8.3.5. Mental Model Development

Mental models often help shape behaviour and explain a person's thought process on how something works (Forrester, 1970). Some participants, both those not adopting and new users, could not understand how paying with their phone worked or how to start the process. For example, P16, a new user, explained during the interview that the participant lacked knowledge of how to start the study. P16 did not know what apps to look for or download. As a technically engaged individual this was shocking for P16:

> I didn't know, like when I agreed to do it, I didn't know what apps to download. I didn't even know what to look for. —P16, new user

Other users made specific comments about not having the “mental model” to see their smartphone as a payment source. P20, a no adopter, was surprised that payment over a phone was even possible, whereas P17, a new user, said “it never even occurred” to use a cell phone to make a purchase. For P17, the thought of doing something serious like making a payment on the same device used to make “stupid text messages” seemed quite peculiar. P17’s mental model for what a cell phone does did not include paying for “stuff.”

8.3.6. Prepurchasing Anxiety

A common trend throughout all user groups was prepurchase anxiety. That is, before they made the purchase, users often tried to get their phones ready and were nervous the phone would not be ready to be scanned. They harboured anxiety that the phone would turn to screen-saver mode, then require a password to be entered, or the barcode would not be ready to be scanned. This could cause a longer wait for people in lines, confusing discussions with store clerks, feelings of inadequacy in not knowing how to use the technology, or the need to switch to another payment form. For example, P12’s diary had numerous entries on prepurchase anxiety:

> I like making sure I have the screen ready—which my screen does not go to sleep. It has more to do with my performance anxieties than the app or the interaction. —P12, new user

Overall, the amount of tension around using mobile payment was far greater than participants thought they would feel. Surprisingly, although these feelings did diminish over time, they were still mentioned by existing users.

8.4. Discussion

My findings showed a range of mobile payment users’ routines, motivations, and benefits, as well as concerns and social issues that add significantly to the understanding of the North American mobile payment experience. In this section, I reflect on related works, as well as introduce new literature, as a lens to interpret key components of these findings on mobile payment.

8.4.1. Mental-Model Development

By the clear distinction of user groups, existing users, and new users, there were some obvious trends in who indicated they would continue to use mobile payment and why. The findings showed that all existing users perceived mobile payment use was easier and faster than other payment methods. They described that their phone was often a more convenient solution to make payments. In contrast, new users who did not enjoy mobile payment (three users) were almost puzzled by why these services were easier and faster than the payment methods they currently used (credit card, debit card, or cash). It was clear from these findings that ease of use is a key inhibitor to use. Further, a lack of user's mental-model development seems to be a key factor to achieving perceived usefulness.

As mentioned in Chapter 2, Hinman and Matovu (2010) found similar mental-model and conceptual gaps between users and mobile payment use. In their example they found that Ugandans who could relate the service to buying and selling cellular airtime, something they could conceptually understand, helped in adoption (Hinman & Matovu, 2010). Although the participants in the present study understood the exchange of funds for services, some did not seem to conceptually understand payment through their smartphones and the benefits associated with it. I see a number of potential solutions to this.

First, one could offer mobile payment around user's routines and habits by offering mobile payment for services they use often (e.g., gas and groceries). Creating a routine around these services through habit was very clearly important in these findings. In fact, both groups of users expressed this sentiment: existing users, and new users. I had expected that would be the case for existing users but not for new users. This sentiment very clearly illustrates the significance of use for routine services. Second, one could design for teachability. Hinman and Matovu (2010) mentioned the importance of "designing for teach-ability" in the case of mobile payment in Uganda. The findings also showed that mobile payment is a community topic and discussions with other patrons on mobile payment can develop in stores, giving users the ability to teach new potential users. However participants' tensions in mobile payment use appear to be social and cultural. In other words, teachability could work to increase the number of mobile payment users, but, according to my findings, most mobile payment systems are straightforward and easy to use from a usability standpoint. User issues appeared not in usage but around the idea of buying with a phone. Thus, increasing the teachability of mobile payment in North America is not likely to increase adoption very much. Third, another possible solution for mental-

model development could include waiting for people to gradually use and learn it over time, although waiting for people's attitudes to change as the technology is mass adopted might result in a lengthy adoption period.

8.4.2. Gamification and Social Benefits

One of the key benefits of mobile payment over other payment methods was the gamification and rewards features in current mobile payment systems. These attributes have the potential to elevate traditional transactional behaviours to a more emotional and exciting experience. In this section I reflect on these findings and what they could mean for mobile payment in the future.

8.4.2.1 The Long-Haul

In my findings, the use of gamification appears to be a successful factor in mobile payment use. This is less surprising when you note that the popularity of casual games has risen dramatically among smartphones users (Neustaedter, Tang, & Judge, 2011). However, in looking at past work by Lindqvist, Cranshaw, Wiese, Hong, and Zimmerman (2011), who investigated why users use Foursquare and collect badges, the gamification element of collecting badges was a decreasing motivator, as the number of users slowly declined in participation after 200–300 days. However, my findings showed that two existing users with more than 1 year of mobile payment experience still cited gamification as a positive element to their mobile payment experience. Although I cannot be sure if they are declining in use due to fatigue, I believe this gamification element coupled with a perceived useful commerce application and habitual routines might sufficient to hold users' attention over time and surpass novelty status. That said, my sample of only two long-term users is small; this outcome warrants further investigation. At the very least, these findings showed that gamification in North American mobile payment systems is an effective complementary component for new users and should continue to be a focus of mobile payment system designs.

8.4.2.2 Social Cohesion

Some of the positive experiences I found with mobile payment systems related to social cohesion. Ling (2008) described social cohesion as a strong "current" in society and strong bonds linking individuals, affecting how people interact what they know about others. This is the opposite of individualism (Ling, 2008). Related to social cohesion is the idea that people have

negative attitudes toward people on mobile phones in public situations and locations (Kindberg et al., 2004; Ling, 2008). That is, using one's mobile phone in public areas has been deemed socially rude and is often met with negative perceptions (Kindberg et al., 2004; Ling, 2008). However, in my findings, participants described the opposite. They believed that mobile payment use created a positive experience for people around them. They explained that this was because they were using their mobile phone in socially positive ways, which in this case was speeding up the line and eliminating wait times for others. Participants believed their mobile payment activity allowed them to "help out" fellow patrons, resulting in social cohesion (Ling, 2008). There is the chance that although the purchaser *thought* the experience was positive for others, it may have in fact been unpleasant or annoying. I did not ask others present during mobile payment purchases about what they thought of the activity. Future work should investigate public reactions.

Negative experiences around social cohesion can arise. As discussed in the findings, users "fiddle" with their phones before use because of prepurchase anxiety, and this could negatively impact social cohesion if patrons are in groups (face-to-face) when purchasing. This further draws attention to focus mobile payment system usability around inclusion of groups (e.g., through gamification), or joint purchasing, or, at the very least, making the process of mobile payment less distracting for the payee. For example, in recent versions of Apple's iOS software, the phone's camera functionality is available from a locked screen with a single finger swipe. Payment options could similarly be integrated in such a manner if people feel safe with such easy access to payment options. Overall current gamification and social benefits are helpful, but there are still issues. These are described in the next section.

Finally, as mentioned in the findings, mobile payment was also associated with a "coolness" factor when one was using it. Yet once mass adoption occurs, this coolness could easily diminish and it is not clear what feelings people may have toward the appearance of using the technology once this occurs.

8.4.3. Trust

In this section I discuss my findings about trust and how they compare to those expressed in past studies on similar activities.

Cost of Purchases

Perhaps most importantly, I believe study findings around habitual routines extends past work by Mallat (2007), who suggested mobile payment is most compatible with small-value payments. In contrast, my findings show users did not report any issues with the monetary value of the payment but rather focused on the actual compatibility of the purchase with their daily routines and habits. The exception was new users who preferred small payments. Again, it should be noted that Mallat's study involved feature phones and was conducted more than ten years ago.

Web mCommerce vs. Mobile Payment

As reported in the findings, there were significant trust concerns among all types of users—even existing users. This differed markedly from Study 1 results. In Study 1, trust mechanisms were quite prevalent and came in three distinct forms: family and friend recommendations, brand awareness, and leveraging trusted marketplaces such as iTunes and Google Play. My findings showed users did not report on distinct trust mechanisms, suggesting that overall trust among users and nonusers was lower than mCommerce web users.

Usability and Security

Findings also showed significant usability issues, as well as real and perceived trust issues. For users to gain initial trust and ongoing trust with mobile payment systems, these issues have to be seriously considered and resolved. The exact perceived risks observed by Mallat (2007) over ten years ago were described by the users in this study. Users are still concerned about network security, vagueness of transaction, and lack of control. Moreover, not only are users concerned that their mobile phone will get lost, stolen or hacked, I was presented with stories of this *actually* occurring. Naturally, not all reported issues from Mallat's study remained. Usability and complexity concerns around "clunky" SMS and direct-payment methods used to be a major concern for users; however, this has been mitigated with mobile-phone advancements (Mallat, 2007). This study showed these concerns diminished or were eliminated altogether.

The Retail Element

As mentioned in the Related Work chapter, mobile payment has a very different characteristic from eCommerce in that transactions can and often do take place in a retail setting. This means the trust models developed around eCommerce over the web lack the

bricks-and-mortar element. That is, they do not have a physical store presence in which one can shop and purchase items. Bricks-and-motor trust mechanisms typically focus on patrons seeing the investment companies have made in their physical space. This could include investment in building and environment such as quality of décor and layout. With the high level of trust concerns reported by the participants, it appears bricks-and-mortar trust mechanisms are not sufficient to establish trust for mobile payment systems, and thus the problem is about trust in the technology. Below, I describe some reflections on my findings which identify some alignment with Zucker's (1986) trust model.

Unlike other trust models, Zucker's (1986) framework was designed for trust in general and not specifically for an eCommerce model. This framework relies on three main types of trust mechanisms: character-based trust (relying on similarities between consumer and customer), process-based trust (trust built through past experience and transactions), and institutional-based trust (trust based on third-party guarantors such as certification and professional organizations; Zucker, 1986). In the findings I saw both brand transfer and building from past relationships as a positive form of trust building, an example of process-based trust. However, users also trusted new applications such as Square and LevelUp. The trust placed with these services seems to stem from friend referrals and the bricks-and-mortar companies with which they were aligned. In examples in this study, trust included charities and large restaurant chains. This is another example of character-based trust.

8.5. Summary

In summary, mobile payment systems are in their infancy in North America. The potential to enhance users' experiences with faster and more useful transactions is possible. There is also potential for mobile payment to aid in social cohesion (Ling, 2008), which has previously been missing in mobile use, as well as a greater sense of usefulness than current payment options provide. However, user challenges with mobile payment still exist. These include trust issues, security, and privacy issues and a lack of mental-model development. To move past these obstacles, this chapter has outlined key areas for improved user experience: mental-model development, trust-mechanism development, and incorporating gamification and social cohesion.

In the following chapter, I present key themes identified from these findings, along with findings from Studies 1 and 2, in a cohesive list of design implications.

Chapter 9. Design Considerations

This chapter describes key themes identified across all three ubi-commerce studies through triangulation of findings, which are presented as design considerations. Design considerations, while they are not requirements, are intended to present information that is important to consider when designing for an ideal ubi-commerce systems. These considerations address the fourth research objective*, to create empirically based ubi-commerce design considerations by triangulating similarities from the three studies presented in this dissertation.* The considerations consider overarching themes presented in the areas of mobile commerce, social commerce, and mobile payment. The main objective of this chapter is to identify common themes and describe social issues, behaviours, and routines of ubi-commerce users in North America. The presented six design considerations are a combination of descriptive and prescriptive. In cases where it makes sense, I provide a light prescriptive description if I feel the knowledge claim is strong enough across all three studies to do so. However, some considerations remain primarily descriptive, as it is hard to know the design cases of future ubi-commerce systems. The expectation with the considerations described below is that both user Interface designers and service designers could benefit from the concepts and use them to inform their designs. In each consideration I provide more insight into this through examples.

The design considerations are presented in two major categories: Social Experience and Device Experience. Social Design Considerations focus on brand extension, habits, personalization, social engagement, and trust. Device Experience Design Considerations focus on crossing mediums and simplification. It should be noted that these considerations are not mutually exclusive, as some suggestions overlap.

9.1. Social Experience Design Considerations

In this section I review four social considerations in ubi-commerce. These considerations tie specifically to social issues.

9.1.1. Social Engagement—Consideration 1: Design for Social Engagement

My first consideration centers on the importance of facilitating social aspects: social media, social networking, and general face-to-face social interaction. Findings from the three studies in this dissertation provide strong evidence that social engagement, on and offline, enhances the ubi-commerce experience. In analyzing Study 1, I first identified that users frequently participated in groups for shopping purposes. This spawned the idea to investigate social shopping in the form of group-shopping sites (Study 2). Further, in Study 1 I saw that allowing users to participate in social engagement while shopping on mobile devices aids in the development of trust. That is, when users share and discuss services and products, it gives them an opportunity to also recommend them, and these recommendations were a notable way to develop initial trust (Study 1). In Study 2 I discovered that users not only participate in social consumption by shopping, buying, and using the products and services in groups, but also need self-presentation tools similar to those found on social-media sites. These findings show that social-impression management can be an important motivator in ubi-commerce. Study 3 puts the user back into the physical world by allowing purchasing in a physical store, which is different from Studies 1 and 2. In Study 3 I saw that this resulted in social cohesion—the positive representation of technology as a social element, not always achieved with ubiquitous technologies, specifically mobile devices. Study 3 showed empirical evidence of positive social cohesion creating a successful user experience and thus should be considered of design importance.

With the current technology available, a solution would be to connect the commerce experience with current social-media applications, as they already allow for most of this functionality. For example, social-media models often support the clustering of contacts into a small group (e.g., Google+) and connect preexisting data with detailed network contexts. These data easily can be used to create dynamic contact lists, which already have functionality to facilitate and display feedback such as “likes,” comments, and event RSVP systems. The ability to provide feedback can help in the management of social identity and event planning.

Further, designers should consider the way ubi-commerce services affect bystanders interacting with the user in the same physical area, as some study results showed that when the interaction between these two individuals was positive, users not only noticed, but made reference to contributing to a better user experience. For example, in Study 3, I saw examples

of how the technology did not only benefit the user but also the environment around them in a socially positive way (e.g., by speeding up the payment process).

It is also important for designers to understand the negative aspects of irresponsible social sharing and consider them when integrating social contexts with shopping. Users must feel comfortable sharing information to avoid privacy risks. For example, if a user is buying something they would not want their social network to know they are buying—such as a sex toy or a political donation—the design should not only allow the user to keep this purchase private, but also have the user feel confident that they know how to do this. This means systems either have to respect users' personal data or make sure the user has control and knowledge of how to execute this control.

Social computing has changed the way users interact online including commerce expectations when interacting and sharing. All three studies shared common findings about the importance of social engagement. As more contextual pressures occur in ubi-commerce, the importance of personalization and a targeted user experience seem to extend beyond the traditional eCommerce need. Therefore, this consideration focuses on the importance of designers integrating digital and physical social elements in ubi-commerce systems.

Key attributes of Design Consideration 1:

- Connect ubi-commerce users with social-media tools to enable social engagement through sharing
- Include impression-management tools so users can present their identity related to commercial activity
- Leverage ubi-commerce to enhance social cohesion

9.1.2. Habits—Consideration 2: Identify and Design for Existing or New Habits and Routines

The *anytime, anywhere* facet of ubi-commerce lends itself to a massive contextual and social variety among mobile users. This variety requires users to be connected in different ways depending on particular factors. One major factor that can play a significant role is users' habits and routines. For example, the successful i-Mode service, which offers digital content to users on the daily commuter train for a fee, has proven only successful in Japan where passengers are subject to long daily commutes (Liang & Wei, 2004). Although the same model has been

attempted in cities of a similar culture, none have achieved success. Without the context of users being on the train with “time to kill,” the success of i-Mode seems unachievable. Building from this past work and my studies, this consideration suggests that if designers want users to adapt and frequently use ubi-commerce, they must focus on identifying the users and incorporate their current habits or create useful new habits around the technology. By habits, I am referring to continual or repetitive usage of the technology on a somewhat fixed interval.

Ubi-commerce works best when users are able to use the systems frequently and on an ongoing basis. In all three studies presented in this dissertation, mCommerce, sCommerce, and mobile payment, I found that when users engaged in habitual use of ubi-commerce, this drove usage, which then enforced the habit further. This consideration reviews findings about the importance of designing around habits and what can be learned from these findings. In Study 1, findings showed that all users had a specific daily routine and timing to their mCommerce shopping. Further a large group of participants shopped in a repetitive pattern, during the same time and in the same place. This was sometimes tied to their physical routines, such as commuting, or other virtual routines, such as checking e-mail. It was clear that the more the mCommerce service aligned with the user’s physical and virtual routines and habits, the more successful that service was, in the amount of shopping activity. The findings from Study 1 about habit and routine prompted me to identify a particular type of user, which was the focus of Study 2: networks of users who shop together on group-shopping sites. Study 3 showed the strongest relationship between successful use of mobile payment and habitual uses. In Study 3, the key types of users—new users, and existing users—mentioned either an alignment with their current habits, resulting in success, or a misalignment, which resulted in nonuse or to some extent lack of mental-model development. Without users clearly understanding how mobile payment benefited them and their routines, challenges around use emerged. Further, Study 3’s findings also showed that these continuing touch points seemed to ease users’ concerns about misplacement of money. An example of a successful frequent habitual mobile payment was the Starbucks app. I saw that users enjoyed the gamification (which supports frequent and ongoing purchases) and mentioned the frequency with which they purchased coffee as a key factor of usage.

An important question when designing the ideal ubi-commerce service or application is, How can user’s benefit from the ubiquity of the commerce activity? Past research on mobile commerce has suggested focusing on a user’s demographic needs and ensuring they are aligned with the technology solution being offered (Kalakota & Robinson, 2001). However I

suggest that the designer go beyond demographics and look at users' habits and routines. For example, a mobile ticketing application could inform a user, who commutes every day after work from the same place and time, of a last minute deal on tickets to a close by event right before their commute.

Key attributes of Design Consideration 2:

- Habitual use drives usage, which then enforces habit
- Habitual use allows users to develop a mental model of new types of ubi-commerce
- Habitual use is reinforced by gamification

9.1.3. Trust—Consideration 3: Develop Trust Specific to Ubi-Commerce

Trust has traditionally been the cornerstone of creating an efficient mCommerce experience. For example, Keen (1999) said that "trust, more than technology, drives the growth of eCommerce in all its forms." Through trust, users and vendors can freely exchange goods with little complexity, as they do not have to consider all possible outcomes (Gefen, 2000). However, looking at these three studies' findings together, not only is trust found to be an important aspect of adoption and use of ubi-commerce, but also unique trust nuances beyond those of traditional eCommerce have emerged. I discuss findings about trust below.

Study 1 explored how mobility and the use of mobile devices affect trust among shoppers. The findings from this study showed few mCommerce users had trust concerns. Overarching themes suggested that trust in mCommerce is built through the app-approval process, direct brand awareness, and family or friend recommendations. Similar to Study 1, Study 2's participants had few trust concerns. I believe this was because of the social focus of the commerce experience. In other words, Study 2 provided a successful example of incorporating social networks, virtually and offline, to aid in trust development. Specifically, including friends and family as a part of the commerce experience helped develop this trust. In Study 3, the findings showed significant trust concerns through both types of users (existing, and new users). However, unlike traditional eCommerce variations of Zucker's (1986) trust model, such as Luo's model (2002), ubi-commerce should include bricks-and-mortar trust mechanisms as well as traditional eCommerce trust mechanisms, as users can often be in a store when using mobile payment.

Together these findings, across all three-study spaces, paint a simple picture. Trust is and will continue to be important in all commerce relationships. However, with ubi-commerce one is no longer limited to just one environment; there is often integration into a host of environments (e.g., on transit, in bed, or at work). Therefore, designers must think about leveraging bricks-and-mortar trust mechanisms and traditional eCommerce trust mechanisms, as well as seek out new trust mechanisms for a truly ubiquitous trust-building practice. This dissertation does not present these mechanisms as they are out of scope for this research, but should be investigated in future research.

Key attributes to Design Consideration 3:

- Continue to apply traditional trust mechanisms
- Integrate with social networks to allow for family and friend recommendations
- Build for familiarity, a precondition of trust
- Leverage brick-and-mortar trust mechanisms, traditional eCommerce trust mechanisms, and seek new ubi-commerce trust mechanisms

9.1.4. Brand Extension—Consideration 4: Extend the Brand for Trust and Familiarity

This consideration is extended from the previous consideration on trust (Design Consideration 3). I expand on the importance of brand extension specifically, as in all three studies, findings clearly illustrated the importance of brand and user shopping success for commerce in the ubiquitous environment. As commerce increases in ubiquity, users will need to know at a glance with what type of company they are dealing.

Study 1's findings showed brand recognition plays one of the most significant roles in trust for mobile commerce. This is because the majority of shopping performed via mobile devices is through a brand with which the consumer already has a relationship. This consideration builds on brand information and suggests designers should integrate their entire company experience and use the mobile medium when appropriate. Similar to Study 1, in Study 3 I saw users' appropriate brand trust. They expected to see brand names when interacting with payment services and when they did not, they expressed trust issues. In Study 2, I saw brand play a significant role in users' impression management. Users thought that being connected to a brand helped identify who they are to their friends and family. Understanding what brand a

user is referencing or aligning with affects how they are seen socially. Compared to eCommerce, ubi-commerce seems more of an extension of the entire “brand experience” and less of a starting point in an introduction to a brand. Aligning the entire ubi-commerce look and feel with a company’s existing entities brought consistency, predictability, and familiarity; factors that supported trust, and usability in Study 1, Study 2, and Study 3.

A negative aspect to the brand discussion is that users might place too much trust in current brands, as a large brand does not guarantee the safety of personal data. Further, based on ubi-commerce as more of a brand extension than a starting point, it would seem reasonable that smaller companies would have less of an opportunity to introduce their services through ubi-commerce than through traditional eCommerce methods, such as search. For example, a small business who wants to create a new app might think twice if they do not already have a strong brand and user base to build an audience from. Similarly, a well-known business should leverage their brand presence and make sure their company brand is aligned with the impression or style their key users wish to exhibit.

Key attributes to Design Consideration 4:

- Ubi-commerce services should be fully integrated into the company’s entire user experience
- Designers should heavily lean on the current branded look and feel of the company

In this section I reviewed considerations associated with social and emotional contexts including social engagement, designing around habit and routines, focusing on trust, and extending brand look and feel. In the next section I consider two technical considerations.

9.2. Device-Experience Design Considerations

As mentioned above, this section introduces two device-experience considerations on integration across mediums and creating simple and useful user interfaces.

9.2.1. Crossing Mediums—Consideration 5: Allow for Cross-Medium and Delayed Purchases

Creating a cohesive ubiquitous experience also means designers need to allow users to easily follow up on and support cross-medium capabilities. Past research has shown that users often need to defer payments because of the social nature of some purchases requiring a discussion with a friend or family member before purchase (O'Hara & Perry, 2001). O'Hara and Perry (2001) reported that half of deferred transactions could be further supported by cross-medium information-transfer strategies. Practitioners should identify this need and incorporate known methods for transactional follow up such as QR codes, and other bar-scanning codes capable of allowing cross-medium transactions. Another design implication tried in the past to revive deferred sales is sending the user a follow-up e-mail with abandoned cart information—a quick link to resume the purchase. This design implication could be updated by having a mobile device notify the user when they are closely located to a store that carries a product or service for which they recently shopped.

Furthermore, as Ancker and D'Incau (2002) showed, mCommerce users are not eCommerce nonadoptors; they interact with both mediums and need to use mobile when it is preferred and desktops when they are preferred. Not allowing cross-medium capabilities causes frustration and adoption issues (O'Hara & Perry, 2001). A possible design solution could be to create browsers that display unique QR codes to provide easy transfer of the user's current URL to one's mobile device. Further, browsers could also be paired between devices (e.g., PC and mobile) to allow for quick sharing between the mediums.

In my studies I saw similar results. In Study 1, a number of participants sought social engagement in purchasing that required cross-medium experiences. Further, in Study 2 the results clearly indicated the participants were multimedium focused. In Chapter 6, I reported that participants talked in person, instant messaged, called each other, used social media, and e-mailed to discuss their ubi-commerce purchasing. Moreover, in all three studies I saw users associate trust with their friends and family recommendations. Systems should support this communication, so decision making and trust building can be fostered.

Because social computing is an important component to ubi-commerce, allowing users to cross mediums to connect seems an essential aspect for successful ubi-commerce. Further, if designers can identify what type of social support (e.g., partner approval or scheduling) users need to make purchasing decisions about their product or service, they should try to leverage

social technologies to simplify the process, thereby eliminating any unnecessary cross-medium activity created by a poor user experience. I expand on the importance of simplification and usability in the next section.

Key attributes to Design Consideration 5:

- Designers should design the experience to support cross-medium transactions
- Designers should create functionality for continued shopping at a later date or on another device
- Designers should identify what type of social support users need to make purchasing decisions and see if social technologies can be integrated to support these needs

9.2.2. Simplicity—Consideration 6: Keep the Process Simple

In the related-works section I reviewed research that discussed challenges in current ubi-commerce such as changing environmental situations, small devices (e.g., screen or keyboard), limited input/output capabilities, and the increase of multitasking. Knowing these weaknesses, this design consideration is based on creating the simplest shopping and checkout process possible. This might include using social sign in to eliminate required registration deals, creating a quite minimalist guest-checkout page, or integrating third-party payment systems such as PayPal or Google Wallet. A potential concern is that users might mistrust these companies and therefore not engage with the third-party payment system.

This challenge was, perhaps, most evident in Study 3; users clearly indicated they wanted a “one wallet solution,” fearing they would not be able to keep up with multiple accounts and recognizing the need to be organized, as “money is important.” Although companies such as Starbucks are able presently to create an app with large success, I believe this is only a temporary opportunity available now, because in North America the e-wallet industry has not identified a standard (e.g., like M-Pesa in Kenya). When this happens, individual app solutions will need to accommodate this wallet and integrate individual payment systems (e.g., Starbucks app), which may seeming become quite time consuming and confusing for the user to organize. In Study 2, I see a need for social sign-in to provide social context for greater personalization and a simplified registration and browsing experience. As mentioned in Design Consideration 2, designers must be careful not to share information users are not comfortable sharing to avoid user trust and privacy concerns. In Study 1, I saw that simplification also ties into my second

consideration, designing for the habits and routines of users. For example, shoppers could be detected based on their pattern of usage and provided with a more browsing-like experience to fill their time.

Simplicity in the ubi-commerce user experience could allow users to explore the service or product in detail, accessible easily through shortcuts, but should not limit the browsing of detailed content, as the user might require this information to make a purchase. Finding this balance might be difficult but would seem worth the attention.

Trying to create an ubi-commerce experience that encapsulates everything the company offers can be overwhelming and create challenges. Further, I believe because ubi-commerce is part of the entire contextual experience and is not solely virtual like traditional eCommerce, a simple experience includes the possibility of complex environmental factors (e.g., riding on the bus, in the shopping mall, or at work). Again, understanding the habits and routines of users helps designers evaluate this need to provide simplicity in achieving user goals.

Key attributes to Design Consideration 6:

- Know the limitations of the devices' input, environment, and multitasking situations
- Create a shopping experience that focuses on action and allows for simple navigation
- Create quick registration through social sign in, third-party payment systems integration, or fast checkouts

9.3. Summary

In this chapter, six ubi-commerce considerations were presented for designers to reflect on when designing for the ubi-commerce experience. These considerations are based on the three studies outlined in this dissertation and further informed from an extensive list of related works in the areas of mobile usage, mobile commerce, and social sharing/awareness. The ubi-commerce experience is a dynamic environment with its own trust mechanisms, contextual limitations, benefits, hardware, software, and perceived user value, and is at a different point of the adoption cycle than that of traditional eCommerce. Thus, it is important to extend beyond the traditional eCommerce mentality and approach the space with a fresh look.

In summary, the six considerations suggest designers for the ubi-commerce experience should reflect on (a) designing for social engagement; (b) identifying and designing for existing or new habits and routines; (c) developing trust specific to ubi-commerce; (d) extending the brand for trust and familiarity; (e) allowing for cross-medium and delayed purchases; and (f) keeping the process simple.

I am not suggesting that more traditional aspects of user experience in eCommerce, such as usability, are no longer important. In fact, numerous findings across my studies point to continued usability concerns among users. However, these considerations are meant to encompass what designers should evaluate in the unique nuances of ubi-commerce—an extension of both eCommerce and bricks-and-mortar commerce. Likewise, these considerations are also meant to be an extension. These concepts are important to review in future work as they provide a basis for understanding and designing for this complex phenomenon.

Also at times there could be competing priorities between two or more design considerations. As presented in this chapter these considerations are not prioritised. However, as designers will have specific objectives and constraints to each situation, prioritization would have to be implemented. For example, if a mobile payment system has a main focus of connecting users socially and this requires complex functionality, the designer would make a tradeoff where the system would be more complex (not following Deign Consideration 6) and adhere more to social engagement (Design Consideration 1).

In the next chapter I discuss limitations of the studies, the considerations, and how they fit in the future world of ubi-commerce.

Chapter 10. Conclusions

This dissertation has explored social issues, behaviours, and routines of North American users of ubi-commerce systems. The goal of this chapter is to summarize the contributions this dissertation has presented, including contributions based on knowledge, descriptions, design, and methodologies. In the second section of this chapter, I discuss the generalization of the contributions as well as the limitations of the three studies and the design considerations presented in Chapter 9. In the third section of this chapter I describe possible future research, followed by some final words about the research space and the dissertation.

10.1. Research Contributions

This dissertation addressed the overarching research question, What routines and social behaviours hinder and promote ubi-commerce? It also completed the overarching research objective of creating knowledge and a foundation of understanding about key ubi-commerce routines and behaviours, in the hopes of informing future designs.

This was achieved by answering the four research questions (RQ 1,2 3, and 4) and four corresponding research objectives (RO 1, 2, 3, and 4). RQ 1, 2, and 3, and RO 1, 2, and 3, addressed three key spaces in ubi-commerce: mCommerce, sCommerce, and mobile payment. Empirical evidence of users' behaviours, routines, and requirements were identified that then informed the design considerations described in Chapter 9, and addressed the fifth research question and corresponding fifth research objective. By achieving the overarching objective, I have contributed detailed descriptions and knowledge of ubi-commerce user behaviours and routines in the field of HCI, and have made notable methodological contributions for studying these users. Below is a summative account of all the research questions and objectives addressed in this dissertation, leading to a discussion of the specific contributions of each research objective.

Research Question 1 (RQ1). What user routines and social behaviours exist for mCommerce and how do users mitigate trust?

Research Objective 1 (RO1). Gain insight into mCommerce users' routines and social behaviours to inform design.

Research Question 2 (RQ2). What user routines and social behaviours exist for group shopping and how well do group-shopping sites support them?

Research Objective 2 (RO2). Explore group-social shopping online, and gain an understanding of how users interact with one another, how groups of shoppers are created, and what motivates users to shop in groups.

Research Question 3 (RQ3). How are users participating in mobile payment in North America on smartphones and what are the user challenges and successes?

Research Objective 3 (RO3). Investigate mobile payment users' practices, motivations, how they mitigate trust, and their successes and challenges in the mobile payment space.

Research Question 4 (RQ4). What design considerations can we establish through the triangulation of empirically collected knowledge around ubi-commerce users' routines and behaviours inform better design and improve user experience?

Research Objective 4 (RQ4). Create empirically based ubi-commerce design considerations by triangulating similarities from the three studies presented in this dissertation.

10.1.1. mCommerce Routines and Behaviours

Research Objective 1. Gain insight into mCommerce users' routines and social behaviours to inform design.

I conducted an empirical study with seventeen participants who reported their mCommerce activities for three weeks and captured 161 diary entries completed for this objective. By achieving Objective 1, I presented a number of contributions:

10.1.1.1 Identification of mCommerce Shoppers Daily Routines and Timing

I described and identified that mCommerce shoppers either shop spontaneously, as a habit or routine, or during fixed time intervals. I also identified that users are making mCommerce purchases outside of their homes. Understanding routines and behaviours of

users is important to inform the design process, as it provides context for users' motivations and helps model designs to support these motivations.

10.1.1.2 IDENTIFIED mCommerce Shoppers Trust Mechanisms

mCommerce users have few trust issues, because of brand awareness, the app approval process, and referrals through friends and family. These were identified as key trust mechanisms. Understanding what is important to build trust among users is essential in commerce, as initial trust aids in adoption and generally trust aids in continued use. Further, because purchases were made on a mobile device, unlike personal computers, they tended to be made from companies with an already strong tie to the user. This information led me to believe that mCommerce is more an extension of the entire brand and less of a starting point.

10.1.1.3 Screen Shots and Video Interviewing as a Method

The final contribution achieved by completing this objective, was the validation of using screen shots as a method to aid in the recollection of past mobile activities. Although past studies suggested similar methods (e.g., Karlson et al., 2010; Nylander et al., 2009), no studies used this method in an mCommerce scenario. Use of this method is an important contribution, as mobile devices continue to increase in popularity; developing strong methods to investigate mobile HCI is important.

Conducting interviews over video chat is also an important methodology. Finding quality participants is a challenge and eliminating excessive travel times has obvious advantages. By achieving Research Objective 2, I was able to provide the methodological contribution of conducting interviews over video chat. Methodological findings included the importance of portraying professionalism and authenticity to the participants, as well as being prepared through detailed communication. These contributions provided the context behind a case study in the book *Evaluating and Designing for Domestic Life: Research Methods for Human-Computer Interaction*, in the chapter "Interviewing Over Video Chat" (Hillman et al., in press).

In summary, I presented four key contributions that were achieved by completing the second research objective. The shopping behaviours presented inform design by suggesting designers target users based on routines and detect user patterns to provide aligned experiences. I did this by creating the design considerations in Chapter 9. Although most of the trust mechanisms/factors that were identified transfer to some form to eCommerce, there were

unique nuances in how trust was applied. Further, by completing this objective I contributed to mobile methods in HCI.

10.1.2. sCommerce, Group Shopping Interaction and Motivations

Research Objective 2. Explore group social shopping online, gain an understanding of how users interact with one another, how groups of shoppers are created, and what motivates users to shop in groups.

I investigated nineteen participants through semi structured interviews and mind maps to visually show their sharing relationships for in-group shopping to complete this objective. By completing this objective, several contributions were identified in the area of social commerce:

10.1.2.1 sCommerce Group Shopping Makeup and Sharing Routines

This study's findings showed that these shopping networks were small, well known to users, and that users knew about their family and friends' technical infrastructure and preference for which medium would be best to facilitate communication, and users shared deals through a variety of mediums. Further, users typically either belonged to sharing groups that were described as hubs, wherein one user did most of the sharing (the hub), or clubs wherein everyone shared equally (shopping club). I also identified that these users prefer a range of communication tools and mediums (e.g., instant messaging, in person, phone, and Facebook). These findings played an important role in informing the design considerations found in Chapter 9. They also provide knowledge and understanding about sCommerce, aligning results with prior research on family communication, such as Ahmet and Matilla (2012), Neustaedter et al. (2006) and Tee et al. (2009).

10.1.2.2 sCommerce Group Sharing Motivations

When I analyzed participants' responses about their motivations and goals, it was most surprising that group-shopping users were doing more than merely shopping. Instead, they were more deeply participating in social activities such as social-event planning, building friendships, and constructing identity. At times these motivations even played a significant role in these users' social lives. By gaining a deeper understanding of users' motivations, designs can create more supportive systems to enhance motivation. Again, these findings help inform the design considerations found in Chapter 9, as well as provide knowledge and understanding about sCommerce, aligning results with prior research in computer-supported cooperative work, such

as Barkhuus et al. (2008), Barkhuus and Tashiro (2010), Joinson (2008), and Lampe et al. (2008).

10.1.2.3 Mind Maps and Video Conferencing as a Method to Explore sCommerce

Although past studies used mind maps to explore family communication, I have contributed to this method by expanding its use to sCommerce-related activities. As sCommerce is still a newer concept, contributions to successful methods are important. The mind map worked especially well in two particular ways: creating familiarity with the interviewee, as drawing images is usually an unexpected but pleasant exercise, and the opportunity to collect rich artefacts from participants.

I presented three key contributions achieved by completing the second research objective. The motivations and group composition components provided key behaviours that can be used to inform designs such as allowing users to track and manage their constructed identities and leveraging the variety of mediums users want. The completion of Research Objective 2 has also made two contributions to social commerce methods in HCI and computer-supported cooperative work, through the use of mind maps and video-conferencing interviews.

10.1.3. Successes and Challenges in Mobile Payment Systems

Research Objective 3: Investigate mobile payment users' practices, motivations, how they mitigate trust, and their successes and challenges in the mobile payment space.

I completed this objective by investigating twenty-one mobile payment users; eleven of these were existing users who had used mobile payments before, and ten were new users. The two distinct user types allowed me to discern a wider range of challenges and successes in adoption and first impressions of users, as well as long-term use. The methods used to distract user experience borrowed from the previous two studies. By completing this objective, several contributions were identified about the successes and challenges in mobile payment that focus on practices, motivations, and trust. These are detailed below:

10.1.3.1 Contribution of Key User Experience Successes in Mobile Payment

This contribution is the identification of successful user experiences in mobile payment, specifically incorporating users' habits and routines, the use of gamification and entertainment, the presence of a positive social perception, avoiding negative regulatory procedures, and

current ease of use and usefulness. These empirically derived successes are important, as they inform designers of what is currently improving user experience in mobile payment systems. Although the successes mentioned are not absolute in all cases, they provide excellent examples of positive experiences that contributed to the creation of the design considerations (see Chapter 9).

10.1.3.2 Key User Experience Challenges in Mobile Payment

I identified a number of current challenges in mobile payment including notable usability issues, notable trust concerns, fragmented mobile payment systems, lack of mental-model development, and users experiencing prepurchase anxiety. These challenges are analyzed in detail in Chapter 8. Here I explore possible design implications from these findings, but most importantly these contributions provide further context to design implications, especially about trust and the ever-present need for good usability.

Further, users reported a challenge when mobile payment did not fit their routines and habits. This is the inverse of what was reported in the success contribution above, which shows users have a positive experience with those mobile payment systems that fit their routines and habits. These positive experiences further validates the importance of building mobile payment around routines and habits.

10.1.4. Empirically Based Ubi-Commerce Design Considerations

Research Objective 5. Create empirically based ubi-commerce design considerations by triangulating similarities from the three studies presented in this dissertation.

By synthesizing the contributions and findings from the three studies, an additional contribution was made by creating the primary descriptive design considerations presented in Chapter 9. These considerations provide a detailed and descriptive account of empirically informed themes of the ubi-commerce user experience. Specifically two main sections of considerations were established: those associated with social experience, such as social engagement, habits, trust, and brand extensions; and those associated with device experience, specifically crossing and the cohesiveness between different mediums, as well as simplicity. These considerations play an important role as they extend the contributions of the first three studies and apply them to workable design implications in ubi-commerce.

To summarize, this section has presented a detailed account of the key contributions of this dissertation, and mapped how these contributions achieved the objectives presented in Chapter 1. The second, third, and fourth research objectives provided individual contributions to each ubi-commerce type (mCommerce, sCommerce, and mobile payment), further validation, and extension of HCI methods to investigate mobile and social commerce, and informed the final contribution of providing ubi-commerce design considerations. These three achieved research objectives combined to achieve the fourth objective: *create empirically based ubi-commerce design considerations by triangulating similarities from the three studies presented in this dissertation.*

10.2. Limitations

This dissertation provided a comprehensive review of ubi-commerce and numerous contributions to user experience, user habits, and user routines. However, as with all studies, there were limitations. These limitations are acknowledged, and this section outlines the main limitations, including generalizing across all types of ubi-commerce, generalizing across all North American cultures, and generalizing across all types of users in mCommerce.

10.2.1. Ubi-Commerce Generalizability

This dissertation covered three ubi-commerce types: sCommerce, mCommerce and mobile payment. However not all forms of ubi-commerce were included in the studies (e.g. fCommerce, and mobile payment by SMS). The three types selected represent current major types of ubi-commerce in North America. One can suspect, with the current young state of ubi-commerce, that other forms will emerge over the coming years. It is also very reasonable to believe that entirely new forms of ubi-commerce will also emerge. This is precisely why the design considerations in Chapter 9 are primarily descriptive, describing the current phenomenon and current known state, carefully not overstating my knowledge claim. As ubi-commerce continues to develop, future work should consider new developments.

10.2.2. North America Generalizability

Shopping routines in Canada are typically thought to be very similar to those of consumers in the United States, given the similar culture of the two countries. However, studies

have shown that Canadians tend to use debit cards more than Americans, who still use cash as their primary payment method (New, 2012). In Study 1, only one participant was from the United States and in Study 2, no participants where from outside of Canada. However, in Study 3, four participants were from the United States. In the two studies with American participants, I did not see any differences between Canadian and U.S. participants. The caveat is that I only had five participants from the United States across all three studies and there is a chance that other users may present different behaviours. Given that all five of the American participants exhibited the same behaviours, I anticipate that one would not find any large differences between Canadians and Americans in additional studies. Another caveat is that while I studied North Americans, I did not collect any data from Mexico (also part of North America); I would expect payment practices in Mexico to be much different from those in Canada and the United States, given the country's vastly different culture. I also want to note that the point of the study is not to generalize all people in the population, but instead to reveal potential issues and challenges in a small group. This suggests future work is needed to better understand specific differences in ubi-commerce between each of the nations. However, this was outside the scope of this dissertation's main objective.

10.2.3. mCommerce Frequent Users

Although beneficial, I recognize that my work in mCommerce (Study 1) did not explore routines and practices that might be experienced by new users. Participants were all periodic or regular shoppers and I did not collect any data from people who were new to mobile shopping and purchasing, or even new to mobile devices. It is likely the case that such individuals would have different shopping behaviours and increased trust concerns initially, as they learned how to shop and buy on their mobile device; however, additional studies are needed to explore this aspect. The study is limited to presenting findings on experienced, regular shoppers who have an established understanding of mCommerce and trust (or mistrust) in it and moves the findings beyond more generic issues of technology adoption. Based on these limitations, the third study was specifically designed to include the new user's perspective.

10.2.4. Study Methods

There are also potential limitations with the study methods. Participants' self-reporting and the diary or interview focus on mCommerce, sCommerce, or mobile payment could have increased participants' shopping activities; yet, this is likely not the case, as I did not discern

high amounts of shopping activities in any of the studies. I also specifically asked participants about trust (albeit very generally), which could have made them think about trust more. Given the findings, I feel responses were not biased in any significant way. The results in the mCommerce study—which showed few trust issues—are strong proof of this. There are also well-documented limitations for *in situ* methods (Brandt et al., 2007) hindering the organic experience; however, I chose the method because the benefits of users recording *in-the-moment* examples and detail were important to the study. I reduced these limitations by providing participants with convenient ways to capture activity while under mobile and active conditions.

Other notable limitations within the study include: sample size, cultural limitations and inter-rater reliability. Specifically, my sample sizes are limiting because they do not allow for statistical significance. Further, from an inter-rater reliability stand point I was also the only coder, however the overall process was overseen by my senior supervisor. Finally, cultural limitations in regards to the participants who participated in the studies are important to mention as they generally belonged to a specific class (middle), were individuals who responded to study postings, as well as technology users who owned smartphones. Thus the study did not capture data from people who might not own the technology that is needed for ubi-commerce, it also likely did not capture data from people who are lower than middle class.

There is also a variety of interlinking factors which affect the overall user experience discussed within this dissertation. Because of the methods chosen, which evaluate the experience all-together, it is not always possible to know which factors are necessarily contributing most to the phenomena. This could be addressed in future studies where factors can be extracted and tested via quantitative analysis. For example, a person could design a study to explore factors such as mobile payment type and gamification functionality where these become independent variables.

10.3. Future Research

Although I made significant contributions to the area of ubi-commerce user experience, these contributions also raise a number of new questions that could be explored in future research, building on my work. Weaved throughout this dissertation I recognized numerous

future research opportunities that could be addressed. In this section I explicitly state and expand on these opportunities.

10.3.1. mCommerce

I looked specifically at frequent users of mCommerce, to better understand a seasoned approach to the space. However future research could look at new users and how they become familiar and develop frequent mCommerce behaviours. This research would be useful to understand the adoption process. Further, a quantitative study could gather a larger participant sample to understand the percentage breakdown of the different types of shoppers (e.g., spontaneous, habit or routine, and fixed time intervals) over a longer time period.

10.3.2. sCommerce

Although the sCommerce study provided key contributions to understanding of group shopping, future research in sCommerce could include a deeper look at the variety of sCommerce systems, such as how users of websites initially set up social networking, adopt to an introduction of sCommerce in applications such as Facebook, and use websites designed specifically to support sCommerce, such as ETSY.

Another direction my contributions could be taken for future research is for social shopping in stores. This could include individuals participating in shopping (in-person or remotely) and those who are not willing participants (bystanders). A specific instance of this would be Morris, Quinn, and Venolia's (2014) study about how users get advice for in-store shopping with social technologies. This paper references and builds on my work; studies such as this, which focuses on how users combine mobile or social technologies to aid in shopping and purchasing, in both online and offline environments, are clear future-research opportunities.

10.3.3. Mobile Payment

The mobile payment environment is quite fragmented at this moment of its adoption phase. Thus, there are many technical solutions in place that are not likely to be supported as mobile payment matures. The mobile payment study mentioned in this dissertation compared all forms of mobile payment. Future research may be able to focus on one successful type of mobile payment (e.g., SMS or FNC). The contributions specific to mobile payment showed trust

issues related to usability concerns. It seems, based on these findings, that future research could take a closer look at usability in mobile payment, compared to other forms of ubi-commerce and traditional eCommerce, to investigate further what users are seeking for usability, as this seems to be an issue with existing users.

10.3.4. Design Considerations

As illustrated in this dissertation, the area of ubi-commerce, by virtue of its current main components (mCommerce, sCommerce, and mobile payment), is at its infancy. Because so much of the future of ubi-commerce is dependent on unknown technological developments, it is clear the design considerations represent a “right here, right now” perspective. As these systems mature, expectations of users will also change. Future research is needed to understand this new type of commerce as it evolves.

10.4. Reflections

In this section I will reflect back on some of the higher level questions which emerge from this work. In particular, I discuss concepts such as: what does it means to move towards the ubi-commerce definition and how these design considerations might be useful in the future; the possible impact of the decreasing cost of hardware such as smartphones; and daunting concern of protecting the user’s privacy.

This dissertation reintroduces the definition of ubi-commerce ten years after Watson (2000) proposed such a vision. Ubi-commerce, according to Watson (2000) is defined as extending beyond traditional electronic commerce by leveraging synchronous activities (context) and using social data (e.g., electronic via social networking sites), allowing for greater integration into user’s daily lives. In some ways, this definition is too broad for really it could cover all the use of all types of technologies for making shopping purchases, e.g., computers in coffee shops, mobile phones at stores, etc. The definition is also in some ways too narrow, as it does not clearly delineate a specific set of technologies that are used for shopping. I chose this definition because I felt it accurately describes the ubiquitous shift of shopping from using computers to mobile devices. The definition specifically includes the social issues which are the primary factors we found within these “new commerce” activities (social commerce, mobile commerce, and mobile payment) which are emerging. While I believe the strength of this

definition is its ability to give researchers a common perspective to discuss these topics, I also believe that future research around eCommerce should in no way be limited to fit within this definition. As payments and shopping continue to evolve within this area, which might include the use of finger print readers or wearable technology such as smart watches or Google Glass, these concepts and, therefore, the design considerations presented in this dissertation, should still hold true. Of course, the context of how they might be applied may change. As these new forms of technology come to-be, revisiting the design considerations (presented in this dissertation) should be the focus of future work as user behaviors and motivations can change over time.

One possible factor worth noting around the ubi-commerce space is the steady decline of hardware costs, as is the case with smartphones. As the cost of consumer data and access to consumers' data becomes more valuable than the actual cost of smartphones, it seems natural that eventually these devices will be distributed as a free product and service. If this was to occur, one would suspect that ubicommerce technologies would be further adopted by consumers. However, the eventual impact of this market penetration is unknown at this time. This concept of free mobile devices is worth noting for future research.

The final topic I will reflect on is perhaps the most sensitive as we evolve towards a cashless society and the effect this could have on a user's privacy. Cash is an excellent way to protect the anonymity around what a consumer buys. For example, when consumers purchase illegal goods or services (e.g., drugs, sex) giving up this anonymity is not a realistic option. While one could argue these services are illegal and thus having a cashless society might be beneficial, others would argue this infringes on our freedoms (Shay, 2013). This becomes even clearer when we take into account purchases that are privacy sensitive, such as those based on political beliefs that are unpopular now or that might become unpopular anytime in the future. Digital transactions always leave a trail, which I believe no single company or government or organization can truly protect or handle without bias. This larger privacy issue is far beyond the scope of this dissertation but needs to be properly evaluated whenever the idea of a cashless society and big data around purchasing is discussed.

Data tends to corrupt; and absolute data corrupts absolutely.

10.5. Final Words

This dissertation fills a knowledge gap, revealed over the last few years, as social technologies continue to expand online and smart mobile technologies penetrate North American. How users buy and shop for items is also changing. If one does not attempt to understand these users, society can only experience delays in efficiency from these systems, and misalignments could also result in large losses (e.g., loss of users' personal and private data), damaging not only individuals but the trust and progress eCommerce has gained over the last ~fifteen years. In contrast, if future work can build on these ubi-commerce contributions, I believe ubi-commerce can develop into the widely accepted form of shopping and purchasing similar to traditional eCommerce. Articulation of current behaviours, routines, and trust suggest what future behaviours, routines, and trust mechanisms are likely to arise with future commerce applications, as they are likely to be similar. One can compare this to studies completed on eCommerce ~fifteen years ago, which now provide a rich background to understand current commerce systems, such as those mentioned in this dissertation.

Go forth and shop!

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Appendix

Documentation of Studies

Study 1: Recruitment Poster Study

Do you use your phone or mobile device to shop?

(e.g., iTunes downloads, application purchases)

SFU SIMON FRASER UNIVERSITY

We are looking for adults (19 and over) like you to participate in our study of how people shop using their mobile device.

The ideal person will...

- use mobile devices, like Blackberries, iPhones, phone's with an Android Operating System, iPads, iPod Touches, Kindles, etc.
- have shopped using their phone or mobile device (either purchasing or just shopping)

Study Details: We are interested in understanding mobile shopping activities more deeply and uncovering what it means to participate in commerce while using a mobile device, e.g., a smartphone, iPad, Kindle, etc. We will use this knowledge to improve mobile shopping designs in the future.
To be recruited for this study, you must be 19 and over. You should be comfortable describing details of how you use your phone online and in conjunction with applications.

Diary: We will pay you $20 if you record your activities and thoughts daily in an electronic diary, where we will discuss it with you afterwards.
Interview: We will pay you $20 for approximately one hour of your time.

For more information, and / or to sign up, contact:

Serena Hillman, shillman@sfu.ca
or
Carman Neustaedter, carman_neustaedter@sfu.ca

Study 1: Sample Semistructured Questions

1. Review entry
2. What where you doing before this purchase?
3. What spurred you to seek out and purchase/shop at this moment?
    a. Was it a new activity or continuation?
    b. Have you looked for this product before?
4. What where you doing after this purchase?
5. If you bought, how much did you spend?
6. Were you familiar with the company you purchased/shopped from?
    a. What type of history do you have with the company?
        i. Commonality – like mindedness
        ii. Past experiences
        iii. Process – promotion via gifts
        iv. Institutional – certificates, authority
    b. What do you think of this company?
7. What was your experience like?
8. What benefit do you feel you got from this experience?
9. What did this experience cost you?
10. You mentioned you had no trust issues
    a. Would you feel different if you had made the purchase over your computer
    b. Would you feel different if you did not know the company
    c. Would you feel different if they
11. Would you like to provide additional comments regarding this activity?

Study 2: Recruitment Poster

Do you use Group Shopping Sites?

(e.g. Groupon, LivingSocial, ethicalDeal, RedFlagDeals)

SFU SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

GROUPON

plum district

livingsocial

OneSpout

We are looking for adults (19 and over) like you to participate in our study of how people shop using group sites.

The ideal person will...
shop using group shopping sites frequently

Study Details: We are interested in understanding group shopping activities more deeply and uncovering what it means to participate in commerce through these websites, e.g., Groupon, LivingSocial, ethicalDeal, etc. We will use this knowledge to improve group shopping designs in the future. To be recruited for this study, you must be 19 and over. You should be comfortable describing details of how you shop using these sites and the relationship you have with friends who you shop with.

Interview: We will pay you $20 for approximately one hour of your time.

CONNECTIONSlab | SFU SIAT
connecting people through technology

For more information, and / or to sign up, contact:
Serena Hillman, shillman@sfu.ca

Study 2: Semistructured Questions

7.48 Social Challenge
Δ fee Friends
Obligation

Section A: Sharing Map

i) Please draw a picture or map that shows how you are connected with all of the people with whom you have significant group shopping interactions.

"Try starting by writing your name down and drawing a circle for you. Then draw some other people. You can draw them anywhere but think about where you place them in relation to yourself."

- Confirm number of people in group
- Frequency of interaction with these people online?
- Tell me about your drawing, who are these people and why did you draw the map the way you did?
- Do you connect with these people offline and/or online too?
- Where and when do you normally shop with the group members?
- Have you always has the same people in your social shopping group? Has that group gotten bigger or smaller, how has it changed?
- Can you think of an instance when you shared with someone outside of this group? Why do you think you shared with them but did not include them on this map?
- Who do you share with the most in this group?
- Where r these people

ii) Could you draw out your offline shopping network paper?

- Tell me about your drawing, who are these people and why did you draw the map the way you did?
- Do you connect with these people offline and/or online too?
- Where and when do you normally shop with the group members?
- Have you always has the same people in your social shopping group? Has that group gotten bigger or smaller, how has it changed?
- Can you think of an instance when you shared with someone outside of this group? Why do you think you shared with them but did not include them on this map?
- Who do you share with the most in this group?
- Where r these people

Section E

Section B: Social Network

Based on the screener questions you emailed us, you use the following social shopping sites...

- How long have you been using each of these social shopping sites?
- Can you remember which site was the first one you used? Why?
- Have you always used the sites you identified in the screener email? Has that list gotten bigger or smaller, how has it changed?
- Where and when do you normally use these social shopping sites? Why?
- Think about when you use these sites, what device do you normally use? Mobile phone, PC? Why?

Room # 5020

- Can you think of a specific instance where you remember reflecting on if you trusted this site or not?

Section C: Network Sharing

Think back to the last time you shared a deal from one of these group shopping sites with a friend or acquaintance…

- Who did you share it with? Are they on your network map?
- Why did you share it with this person? Why not someone else on the map?
- How did you share this deal? (ie. email, built in share button, etc.)
- What device (mobile phone, tablet, pc etc.) do you use when sharing these deals?
- Would you say this is the device you regularly use to browse?

Think back to the last time someone shared a deal with YOU.

- Who shared it with you? Are they on your network map?
- Why did this person share it with you?
- How did they share this deal? (ie. email, built in share button, etc.)
- Why do you think they shared it like this?

Section D: Specific instances of shopping

Think about the last time you made a purchase using one of these group shopping sites…

- When did you make this purchase? Time of day and date.
- Did you have any trust concerns when you made the purchase? Why or why not?
- Were you concerned about the company you were making the purchase from?
- Were you concerned about other people around you seeing you make the purchase?
- Were you concerned about your family seeing the purchase?
- What device do you use to make this purchase?
- Would you say this is the device you regularly use to purchase deals?
- At what time of the day did you make this purchase?
- What device did you use when browsing these deals?
- Would you say this is the device you regularly use to browse deals?
- Are there any instances of shopping that stand out in your mind as unusual or interesting?

Section E: Group Dynamics

- What is each person's duty in your shopping group?
- Are they discussed ahead of time or do people just know?
- Would you say people have "roles" within this group? (e.g., follower, shopper, buyer, hunter, leader etc)
- Are there ever any tensions in your group?
- Do you trust your group members will help you?
- Do you try your best to help them?
- Do you trust they will send the pertinent deals?
- Do you think they are spamming you ever?
- Do you think you are spamming them ever?

Map – who the people are, how they communicate, how they communicate with them and are you satisfied with this communication

Ask participants to categorize Intimate socials vs extended socials

From this – how frequently they communicate with each group.

Are you satisfied with the amount of communication and quality?

- How often you share vs how often you get
- Why not share more?
- How many devices do you access these deals on? Mobile, im, facebook, email?
- Have you ever used these deals to facilitate social activities?
- You primarily share deals because?
- I would share more deals if…
- Online vs offline shopping benefits
- Do you get feedback when you send deals? How does this make you feel?
- Do you feel obligated to respond or share back when someone shares with you?
- Do you want better sharing tools?
- Do you buy expensive or cheap things?

Rea - 1030

~~John 4:45~~

Tomorrow Shawn 5:30

John 6:15 4:45

Study 3: Recruitment Poster

Study 3: Semistructured Questions

Questions: Mobile Payment Study

Section 1: Background

What mobile payment systems do you currently use? Please list them in the order you started using them.
Do you remember what motivated you to download the first mobile payment system? And the other mobile payment systems?
How long after you downloaded did you use the service? And the other mobile payment systems? Why?
How many of your friends would you say use a mobile payment system? How do you know that is the number?

Section 2: Specific Instances

Please tell me about the first time you used each of these mobile payment systems.
Do you remember why you decided to use the mobile payment systems?
What did you purchase and when?
Why did you decide not to use cash, credit card or debit?
Do you remember your feeling on the transaction? Were you satisfied? Nervous? Happy? Concerned?
Did you have any trust concerns when making the purchase? Why or why not?
Were you concerned about the company you were making the purchase from? Why or why not?
Did you have any concerns about your family seeing this purchase?
Did you have any concerns about other people seeing you make this purchase?
What were you doing before the purchase?
What is the most expensive item you have bought with a mobile payment system?
When did you buy this item and how much was it?
Why did you decide not to use cash, credit card or debit?
Do you remember your feeling on the transaction? Were you satisfied? Nervous? Happy? Concerned?

Did you have any trust concerns when making the purchase? Why or why not?
Were you concerned about the company you were making the purchase from? Why or why not?
Did you have any concerns about your family seeing this purchase?
Did you have any concerns about other people seeing you make this purchase?
What were you doing before the purchase?
What was the last item you purchased using a mobile payment system?
What time of the day and what day was it?
What prompted you to make this purchase?
Why did you decide not to use cash, credit card or debit?
Do you remember your feeling on the transaction? Were you satisfied? Nervous? Happy? Concerned?
Did you have any trust concerns when making the purchase? Why or why not?
Were you concerned about the company you were making the purchase from? Why or why not?
Did you have any concerns about your family seeing this purchase?
Did you have any concerns about other people seeing you make this purchase?
What were you doing before the purchase?

Section 3: Routines

What would you say is the most common item you purchase using a mobile payment system?
When was the last time you used mobile payment to purchase this item?
How often would you say you use mobile payment to purchase this item?
Do you normally perform an activity or do something specific before you make this purchase?
Is there a particular time of day you find yourself using mobile payment more than others? Why?

Section 4: Changes in Use

Have you used any mobile payment systems that you no longer use?
Why do you no longer use these mobile payment systems?

Do you remember why you decided to download this mobile payment system?
Do you remember what you have purchased with this mobile payment system?
Do you remember your feeling on the transaction? Were you satisfied? Nervous? Happy? Concerned?
Did you have any trust concerns when making the purchase?

Section 4: Conclusion

Do you consider yourself a person who is on the leading edge of technology? Why?
Do you feel like mobile payment has altered how you shop? Why?
Why not use mobile payment more?
What do you feel are the benefits to using mobile payment?
Are there any instances of shopping that stand out in your mind as unusual or interesting?
What items have you purchased?
Any specific type of purchase that you wish would accept mobile payment?
Additional features?