THREE ESSAYS ON THE VALUE OF ONLINE SOCIAL COMMERCE

by

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Abstract

Online social commerce is a new phenomenon at the intersection of social media and e-Commerce. While it triggers rising interest from practitioners, the progress of its understanding in academic research is delayed by conceptual and empirical challenges (e.g., multifaceted nature, interdependent users). This thesis aims to tackle these challenges to further the understanding of *whether*, *under which conditions*, and *how* socially infused settings enhance the quality of consumers' experience.

In Paper #1, I develop a view of social commerce that accounts for two key aspects of social media (i.e., they are supported by technological platforms, and they rely on social networks) as well as for the nature of the context (i.e., exchanges between consumers and business actors). This paper serves as a conceptual background for two studies that focus on consumers' product search via social network (SN)-enabled shopping platforms.

These two studies are conducted within a similar experimental environment that uses a custom-developed restaurant review site integrated with Facebook. In Paper #2, I analyze *whether* and *under which conditions* SN-enabled shopping settings are effective in facilitating experiences that are diagnostic (i.e., informative) and serendipitous (i.e., prone to unexpected but useful findings). I find that serendipity is a prominent benefit of SN-enabled platforms versus traditional ones, and that diagnostic and serendipity are both more contingent upon the size of shoppers' friendship network when the platform is designed with private versus open boundaries.

While Paper #2 focuses on design effects, Paper #3 concentrates on the effects of social ties. I explain *how* two properties of consumers' social capital (i.e., quantity and quality) influence two important outcomes of consumers' experiences: their perceptions of usefulness and enjoyment. I find that the three proposed intervening factors (mobilizing friends' informational resources, effort reduction, and curiosity arousal) do not equally facilitate usefulness and enjoyment, which creates interesting future research avenue.

In summary, this research contributes by: (1) offering a rich account of the social commerce phenomenon, (2) explaining why and how online social relationships matter, and (3) offering some methodological lessons for future investigations.

Preface

The research described in this thesis has been conducted by the student in consultation with members of the supervisory committee. The student has had the full responsibility in identifying and designing the research program, analyzing the research data, and preparing this manuscript.

The research was conducted in accordance with the suggested ethics guidelines of the Human Ethics of the UBC Research Ethics Board. UBC Behavioral Research Ethics Board approved this research via certificate number H11-03575 in December 2012.

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List of Abbreviations

AVE: Average Variance Extracted

B2B-R: Relations among business actors

B2B-I: Interactions among business actors

C2C-R: Relations among consumers

C2C-I: Interactions among consumers

C2B-R, B2C-R: Relations between consumers and business actors

C2B-I, B2C-I: Interactions between consumers and business actors

CA: Cronbach's Alpha

CI: Confidence Interval

CR: Composite Reliability

IS: Information System

IT: Information Technology

OSCN: Online Social Commerce Network

PE: Perceived Enjoyment

PLS: Partial Least Square

PU: Perceived Usefulness

SEM: Structural Equation Modeling

SMN: Social Media Network

SN: Social Network

SNS: Social Network Site

STD: Standard Deviation

UGC: User-Generated Content

Acknowledgments

It is a true pleasure to acknowledge those who have been so important to me for the accomplishment of this work.

First, I wish to express my enduring gratitude and sincere appreciation to my committee. Both my dissertation and I have benefited tremendously from their mentorship. I owe a lot to Dr. Izak Benbasat for his guidance and goodwill as my research supervisor. Thanks Izak, for your endless patience and for everything you taught me about research and academia!

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I was also very lucky to have such an experienced external committee member in the person of Dr. Caroline Haythornthwaite. Caroline, thank you! It has been a privilege to benefit from your insights, especially in the domains of virtual communities and online social networks.

This thesis has involved some technical work and I would like to acknowledge the work of Chad Nantais and his colleagues at themerchantlab for helping me develop the experimental platform. Thanks Chad, Brian, and Stephen for having been so reliable, responsive, and detailed-oriented. I would also like to thank my friend Janine Bloechlinger for creating the visual identity for the website. She is a very talented designer and I am happy to have received her help.

I wish to acknowledge the financial support of the doctoral program at the Robert H. Lee Graduate School at UBC's Sauder School of Business, the Social Sciences and Humanities Research Council of Canada (SSHRC) Canada Graduate Scholar doctoral fellowships program, as well as the support of my supervisor, and of HEC Montreal.

The entire MIS faculty at Sauder School of Business, as well as our doctoral program assistant Elaine Cho, and our divisional assistant Paula Chang, have been extremely supportive. Special thanks to Ron Cenfetelli for being available and offering his advice on the research method issues I was facing. I also benefited a lot from the support and discussions with my fellow PhD students or colleagues who already went through the same journey I just completed, in particular Ali, Burcu, Chee-Wee, Cheng, David, Eric, Kafui, Landon, Michael, Paul, and Sameh.

I have the pleasure and honor to work with wonderful colleagues in the Department of Information Technologies at HEC Montreal, and I would like to thank them for welcoming me into their group, and for offering their support during this year of writing my dissertation. A very special thanks goes out to Dr. Michel Chokron for his early guidance, as well as to Dr. Henri Barki for introducing me to the world of IS research. Your mentorship in my early years as a graduate student at HEC has been an eye-opener, thanks Michel and Henri!

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I was fortunate to have several great friends who were an essential part of my life as a graduate student in Vancouver, in particular Elodie B., Denis F., Florian V., Franck V., Gaetan M., Guillaume L., Janine B., Julie V., Julien H., Mario D., Marty M., Mathieu C., Matthias B., Nathalie B., Odile F., Patricia H., Paolo M., Ruth M., Sunita S., and all the welcoming members of the "Academix Anonymous" football team! Other kind souls in Montreal (in particular Lionel P., Nada D., Sandrine P-T., Sylvain A., and Vanessa S.) and in more remote locations (in particular Aurélie B., Aurélie C., Caroline M., Fabien M., Géraldine M., Julie D., Romain B., Thomas K., Wilfred J., Zineb B.) kept supporting me from far away, and I would like to express my gratitude for their genuine and forgiving affection.

Lastly, I am profoundly indebted to my family for their immense support and faith in my abilities. My mother and sister Emilie have been my lifelong pillars, and this work has been fed by their love and encouragement.

This thesis is dedicated to my parents,
Michel and Odile Grange.

Chapter 1: Introduction

E-Commerce continues to grow, with 201.1 million Americans (90.1% of the online population) expected to be buying online by 2015 and $269.8 billion sales forecast (almost twice the amount of 2009)[1]. Thus, the e-Commerce sector is filled with opportunities for retailers, and even more so for those that can find ways to improve online *shopping experiences* (Briggs 2013).

Online vendors are now incorporating *social functionalities* (e.g., enabling users to connect and interact) into e-Commerce environments to deliver more engaging and satisfying online customer experiences (Browne et al. 2012; Leitner and Grechenig 2007). This is due in part to the increasing popularity of online social media (Kaplan and Haenlein 2010). For example, social network sites, which enable Internet users to develop and exploit social relations formalized and maintained by a digital platform, now capture as much as 20% (37 minutes per day) of Americans' online time[2].

In this context, this thesis offers an investigation of *online social commerce*, a phenomenon at the intersection of two seemingly complementary paradigms: online social media networks (e.g., when online users are embedded within a digital social network) and e-Commerce (i.e., when online users are in a shopping context). Online social commerce emerged in the early 2010's and is expected to represent a $30 billion market by 2015 (Anderson et al. 2011).

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[1] 'Healthy Growth for Ecommerce as Retail Continues Shift to Web'. Accessible at http://www.emarketer.com/Article/Healthy-Growth-Ecommerce-Retail-Continues-Shift-Web/1008284

[2] 'Daily time spent with media according to US consumers, 2010-2012'. Accessible at http://www.emarketer.com/Article/Social-Digital-Video-Drive-Further-Growth-Time-Spent-Online/1009872

1.1 Context Overview

A myriad of digital business models that exploit synergies between what is afforded by online social networks (e.g., connecting and communicating with others) and online shopping (e.g., using the Internet to promote and exchange products and services) have developed in recent years (The Economist, 2010), often fuelled by substantial investments from venture capital[3] and e-retailers[4]. This phenomenon highlights the rise of online social commerce, a form of commerce mediated by online social media (Wang and Zhang 2012).

Examples of practical social commerce initiatives are extremely varied. They include:

- *Intermediary websites* via which consumers connect and engage with brands and products (e.g., Kaboodle, Pinterest) or with stores and services (e.g., Foursquare, TripAdvisor, Airbnb),
- *Online retailers* that incorporate social network features into their e-commerce site (e.g., Amazon[5]),
- *Social networks sites* (SNS) that have evolved to enable businesses to have a presence, connect to, and dialogue with consumers or other businesses (e.g., Facebook, Twitter).

In sum, consumers as well as business entities, such as a product, a store, a brand, or a brand ambassador (e.g., an athlete) may be involved in online social commerce via a diverse set of configurations.

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[3] This Globe and Mail article lists a few examples of VC investments in Social commerce in 2012 http://www.theglobeandmail.com/technology/tech-news/lure-of-facebook-social-commerce-for-vcs/article4098015/

[4] For example, in March 2013, Amazon acquired Goodreads with its 16 million users base http://techcrunch.com/2013/03/28/amazon-acquires-social-reading-site-goodreads/

[5] https://www.amazon.com/gp/facebook/ (Amazon's functional integration with Facebook is implemented on a small scale (beta); thus, it seems to be a relatively experimental project at the moment).

1.2 Research Motivation

E-Commerce researchers and practitioners are interested in identifying how Information Technology (IT) platforms need to be designed to assist consumers in finding satisfying products, decrease search efforts, and deliver exciting interactive experiences. For example, by identifying a reduced number of options in the form of advice or recommendations, product recommendation agents can reduce consumers' information overload and facilitate decision-making (Xiao and Benbasat 2007). Such decision-aid software are especially useful when consumers have a clear idea of their needs or preferences and search for accurate match of products to these, but appear to be less well suited to information seeking tasks whose target is less specific (Choo et al. 1999), a shortcoming sometimes referred to as 'the serendipity problem' (Iaquinta et al. 2008). Conversely, social commerce, which reveals and emphasizes interdependencies among people and between people and informational content, seems to be better positioned to assist consumers in ill-defined product exploration tasks (Goldenberg et al. 2012; Indratmo and Vassileva 2012; Yi et al. 2010).

Internet users are now used to connecting with each other, and they produce a growing portion of the online content (Zeng and Wei 2013). It has also become common to be exposed to brands and products via the behaviors or opinions that online friends disclose, for example, purchasing a product, checking-in to a store, or liking a brand (Sareen 2014). Indeed, as many as 33% of SNS users discover brands, products, or services via their friends' posts[6]. Hence, online platforms that provide features for users to form social networks and share content (i.e., user-generated content, UGC) have the potential to enhance consumer

[6] Source: "Engaged Social Followers are Your Best Customers: How Marketers Can Leverage Social Tools Throughout the Customer Life Cycle," Forrester Research, Inc., September 2013.

engagement (Parise et al. 2008). For example, users of the social commerce site Wanelo "save" 8 million products a day ("save" is Wanelo's counterpart to a "pin" on Pinterest or "like" on Facebook), and spend on average 16 minutes on the site[7]. Thus, online social commerce is hoped to provide an effective channel for online merchants to represent and exploit the inherently social nature of shopping-related activities (e.g., specifying one's needs, identifying products or stores that fit these, sharing experiences, showing brand attachment, and influencing others' choices).

Despite such potential rewards, retailers seem to remain reluctant to provide social network-enabled environments to their customers. For instance, Social Labs found that the *Log in with Facebook* feature, which is the core enabler of online environments powered by Facebook's social graph, was adopted in 2012 by only 30 (i.e., 6%) of the top 500 online retailers[8]. In addition, the ability of the Facebook platform to drive revenues for e-Commerce businesses has not been fully demonstrated yet (Mulpuru 2011). In sum, while the creation of online spaces that combine social network and e-Commerce features is expected to improve online consumer experiences, there is still a lot of uncertainty with respect to the nature and viability of such initiatives. Practitioners require a sound understanding of the potentials, implications, and risks related to online social commerce. Researchers can attend to this need by empirically investigating the properties and performance of exemplary cases. As the next section explains, this requires addressing important conceptual, theoretical, and methodological issues that currently delay the progress of social commerce research.

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[7] http://techcrunch.com/2013/03/27/with-6m-users-hot-social-ecommerce-startup-wanelo-is-seeing-8m-products-saved-every-day/
[8] http://www.sociablelabs.com/download-login-study/

1.3 Research Gaps and Expected Contributions

The development of social commerce is recent and has been occurring at an extremely fast pace driven by paradigm-changing technological developments, e.g., social network data portability - the ability to carry user profiles and social graphs across platforms (Bojars et al. 2008), and by powerful behavioral shifts, e.g., online users becoming curators of product-related content (Hall and Zarro 2012). For example, Pinterest just became the fastest site ever to break through the 10 million unique visitor mark[9]. As a result, there has been limited time for scholars to conduct investigations and convert findings into manuscripts. In addition, together with the absence of established practices in the social commerce domain, the lack of emergence of industry leaders may have also delayed systematic studies. In contrast, researchers have for example strongly focused on the use (e.g., Tufekci 2008a), benefits (e.g., Koroleva et al. 2011), and privacy-related concerns raised by SNS (e.g., Acquisti and Gross 2006), a trend facilitated by Facebook being the reference model, and thus the de facto empirical playground. Thus, the analysis of the online social commerce phenomenon that this thesis offers hopes to make a timely contribution to the extant literature by addressing three key research gaps, which are described next.

1.3.1 A Need for Domain Definition and Conceptual Clarity

In addition to factors such as the rapid pace of technological change and lack of a dominant practice or platform leader, social commerce research is also lacking conceptual accuracy because there has been little effort invested in depicting its distinctive nature. This is evidenced by the fact that a large majority of the literature is found in trade press articles (L.

[9] http://techcrunch.com/2012/02/07/pinterest-monthly-uniques/

Zhou et al. 2013). As a result, conceptual ambiguity is considered one of the major issues that social commerce research faces (Wang and Zhang 2012; Yadav and Pavlou 2014; Yadav et al. 2013). This is a serious problem in that it makes it difficult to identify (and measure) aspects that are worthy of theoretical scrutiny and, subsequently, to conduct reliable and forward-thinking investigations (MacKenzie 2003). Several scholars in Information Systems (IS) have already voiced the need to develop theories that tap into the unique aspects of a phenomenon being studied (Evermann and Tate 2009). This approach implies that researchers need to think hard about what is theoretically different about the class of IT they study, and that they choose or develop theories according to those unique properties (Majchrzak 2009). This thesis addresses the conceptual gap in the study of social commerce by outlining its essential characteristics but also what it affords to its users. Building on the premise that the concept of social network is central to defining social commerce, I make the case for the utility of considering social commerce in terms of *IT-enabled network structures into which consumers and products or businesses are interdependent entities*. I further explain the implications of this assumption and the directions it can yield for future research. The conceptual effort to delineate the key properties, affordances, and boundaries of social commerce is intended to provide an important first step toward programmatic research (Jarvenpaa et al. 1985).

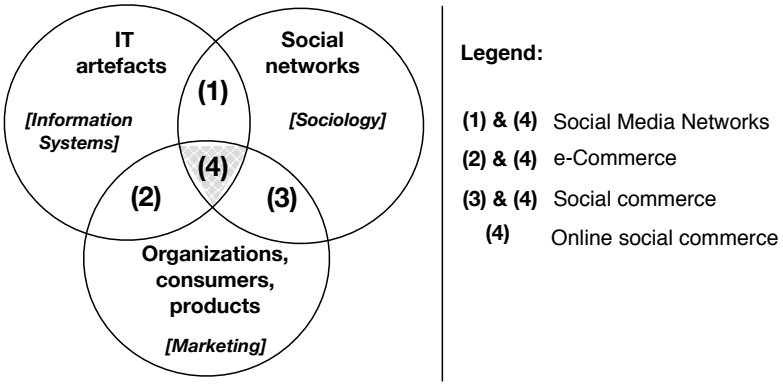
1.3.2 A Need for Integrative Theoretical Foundations

A related reason for the current conceptual ambiguity surrounding the online social commerce phenomenon pertains to the lack of integrative theoretical foundations to guide its study. Similar to the paradox of conceptualization where "proper concepts are needed to formulate good theory, but I need a good theory to arrive at proper concepts" (Kaplan 1964

p. 501), both aspects seem to be constraining each other. The limited understanding of the distinctive characteristics of social commerce (a point discussed in the above section) impedes the development and use of good constructs and theories, and the lack of adequate constructs for studying social commerce limits the understanding of its nature. Recent research demonstrated the utility of studying the networks that are supported by social media by combining an IS and a social network analysis lens (Kane et al. 2014). In this thesis, I follow-up and expand this approach by reasoning that theoretical foundations for the study of online social commerce would benefit from combining insights currently scattered among three fields: Sociology, which has developed tools for describing, explaining, and measuring *social networks* - social ties between people (Borgatti and Halgin 2011; Wasserman and Faust 1994), Information Systems (IS), which has explained how to conceptualize and study the use and value of *IT artefacts* – designed objects that rely on an IT component to deliver a function (Benbasat and Zmud 2003; Markus and Silver 2008) and Marketing, which has investigated relationships between *organisations, consumers, and products* (Kotler and Levy 1969). Integrative research is challenging because of the conceptual distance that might exist among different fields of study and the uncertain compatibility of their underlying assumptions (Okhuysen and Bonardi 2011). Nevertheless, this thesis will show that an integrative approach to understanding online social commerce it is not only a feasible approach but also one that has the potential to generate interesting insights. In summary, the proposed multidisciplinary perspective (Figure 1.1) adopted in this research considers online social commerce as a subset of three macro phenomena (1) social media networks, i.e., online environments where users are socially embedded, (2) e-Commerce, i.e., the conduct of

IT-mediated commercial exchanges, and (3) social commerce, i.e., commercial activities that occur in, or are influenced by, actors' social networks (not necessarily online).

Figure 1.1 A Multifaceted Perspective on Online Social Commerce



1.3.3 A Need for Original Methodological Approaches

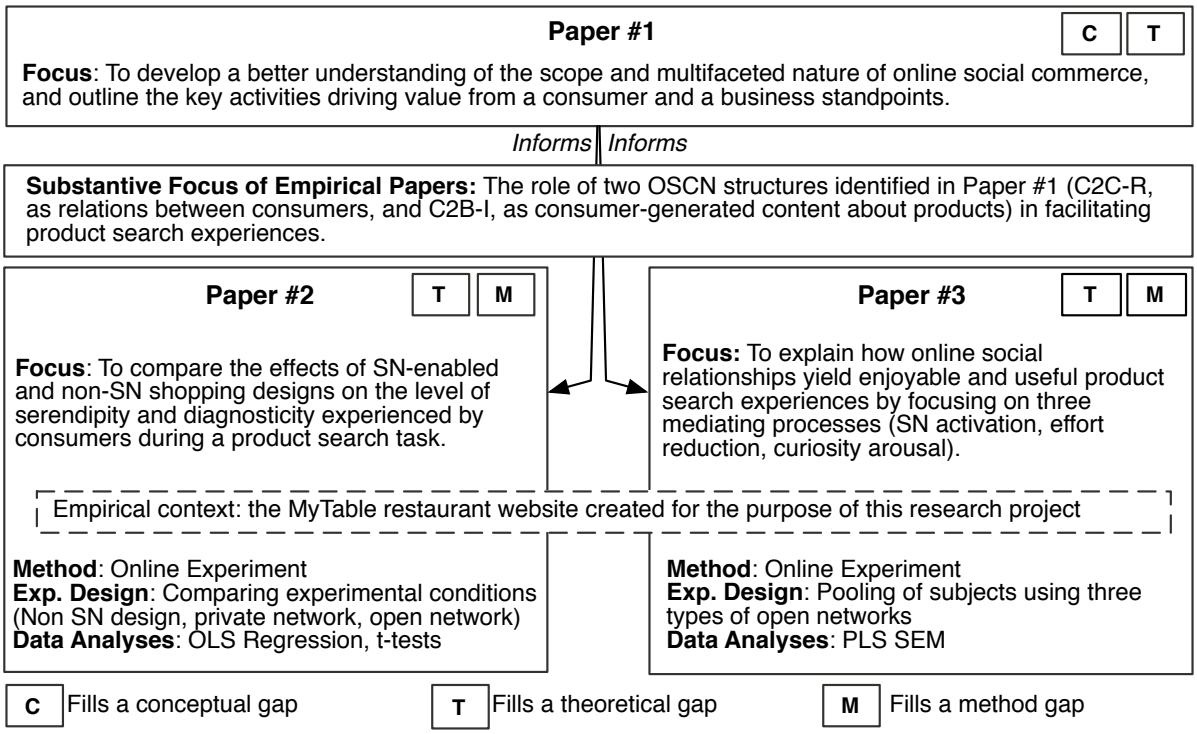
Similar to theories, methods for collecting data in social commerce research need to be attuned to the nature of the phenomena and questions being investigated (Hennig-Thurau et al. 2013). Hence, the empirical study about online social commerce would seem to demand that researchers are able to (i) manipulate or at least specify the *design* of those digital environments, (ii) capture and explain the *behaviors and/or perceptions* of the actors taking part in these environments, and (iii) take their *social embeddedness* into account (i.e., identify and measure the properties of their social relations). Among the few studies that examined social commerce cases, some have offered a number of important insights by accounting for points (i) and (ii). For example, Olbrich and Holsing (2011) reported that customers' purchase behaviors were improved by tagging features but weakened by user-generated product lists and style boards. Goldenberg et al. (2012) examined the effectiveness of customers' product exploration as a function of how the underlying networks of content contributors and products was made visible by the platform.

Concurrently satisfying the three criteria mentioned above is a difficult endeavor. Yet, prior research has warned that social commerce studies that do not apprehend shoppers' social embeddedness (i.e., point (iii) above) leave one essential part of the phenomenon unattended (Hennig-Thurau et al. 2013). In this regard, Sundararajan et al. (2013) highlighted the problematic nature of collecting data from digital networks, especially via experimental setups where randomization is a critical factor. For example, if a researcher wanted to conduct such an experiment, s/he would need to account for the fact that subjects' view of the environment is going to be contingent upon their social structure. Also, this researcher would need to consider which aspects of the digital social network would have to be manipulated to mimic real-life situations while enabling meaningful theoretical comparisons, and how h/she will sample from the network to obtain homogenous groups. Such complexities need to be addressed because relational ties are defining features of social media networks (Kane et al. 2014; Peters et al. 2013), and because a key aspect of the IS field's contribution to online social commerce research lies in clarifying the implications of its most meaningful design aspects. This thesis will show how it is possible, albeit not without drawbacks, to study consumers in action within an experimental social network enabled shopping environment.

1.4 Research Questions and thesis Structure

This thesis aims to address the aforementioned conceptual, theoretical, and methodological gaps in order to better understand *if*, *under which conditions*, and *how* online social commerce settings facilitate high-quality consumer experiences, as illustrated in Figure 1.2. It fulfills this objective via three papers summarized next.

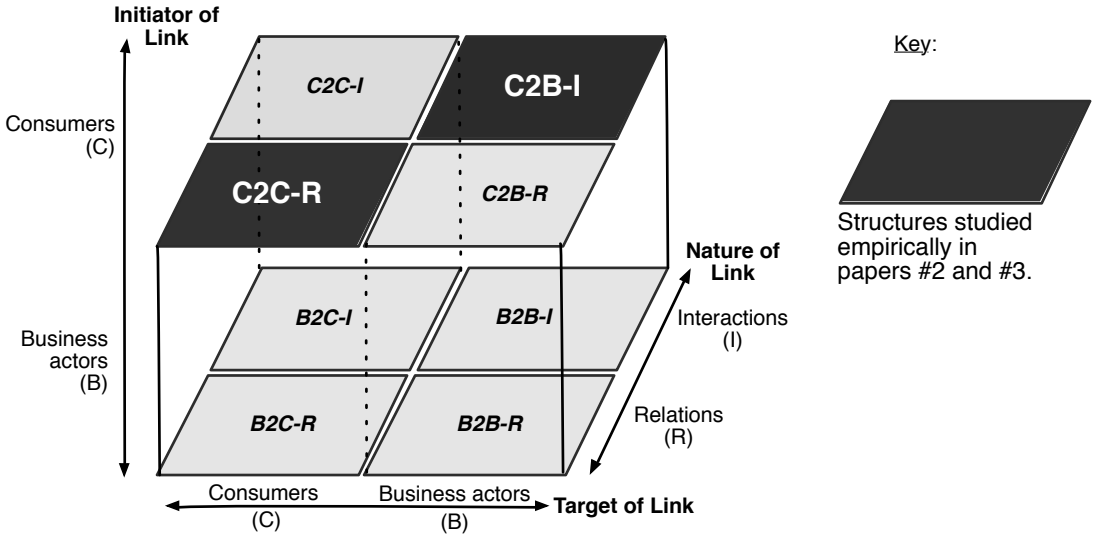
Figure 1.2 Thesis Structure



Paper #1 (Chapter 2 of the thesis) is entitled "***An integrative network-based conceptualization of online social commerce value***". This paper disambiguates and conceptualizes the domain of social commerce to facilitate future theory development and cumulative research (Weber 2012; Yadav 2010). It yields a typology of the relevant network structures (Figure 1.3) that are manifest in social commerce. The typology was developed based on an analysis of social commerce's key properties that yielded a set of exchanges categorized using three dimensions: (i) *who initiates a link*: consumer vs. business actor, (ii) *who is the target of the link*: consumer vs. business actor, and (iii) *what is the nature of the link*: a relation vs. an interaction. The paper then builds on this typology of online social commerce network structures (OSCNs) to develop a framework that explains the value opportunities that forming or acting on these structures may afford to consumers and businesses, and the role of social commerce platforms' technological capabilities in

facilitating these value opportunities. Hence, this paper provides a conceptual background for the two subsequent empirical studies (paper #2 and paper #3) where I investigate consumers' product search in environments that rely on two types of online social commerce network structures: C2C-R, which refers to consumers-to-consumers relations (e.g., consumers' friendship networks), and C2B-I, which refers to consumers-to-business interactions (e.g., consumers' product reviews).

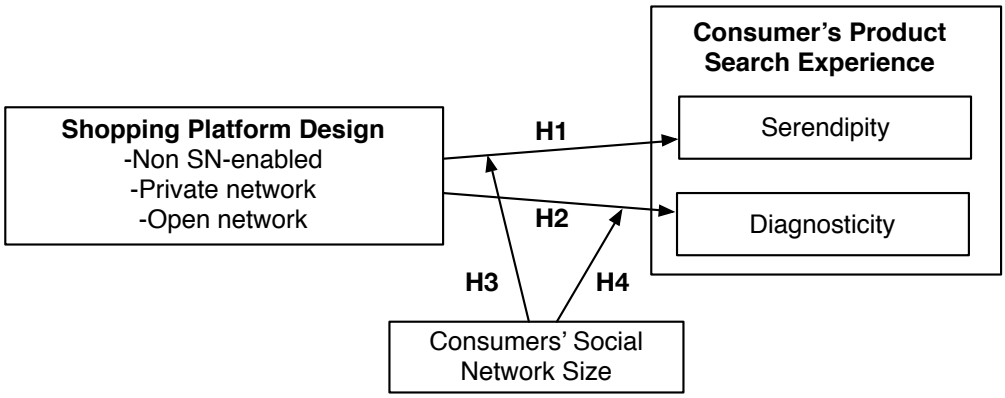
Figure 1.3 Online Social Commerce Network Structures



Paper #2 (Chapter 3 of the thesis) is entitled "***Are social networks any good for online shopping? The effects of social network enabled shopping on the diagnosticity and serendipity of consumers' product search experience***". This paper investigates *if* and *under which conditions* SN-enabled settings yield product search experiences that are more serendipitous (i.e., prone to unexpected findings) and diagnostic (i.e., informative) than those happening in a non SN-enabled context. In addition, two types of social network designs are compared, those with open boundaries (i.e., when users can traverse and access the user-generated content created by any user in the whole network, including their friends) and

those with private boundaries (i.e., when users can access the user-generated content created by their friends only). An online experiment was conducted using the custom-developed My Table website, which featured restaurants as products and integrated with Facebook to include and take into account subjects' friendship relations. The paper documents the relative effectiveness of SN-enabled shopping designs in inducing diagnostic and serendipitous product search experiences compared to traditional (non-SN) ones, accounting for the contingent effect of shoppers' social network size. Figure 1.4 illustrates the research model investigated in this paper.

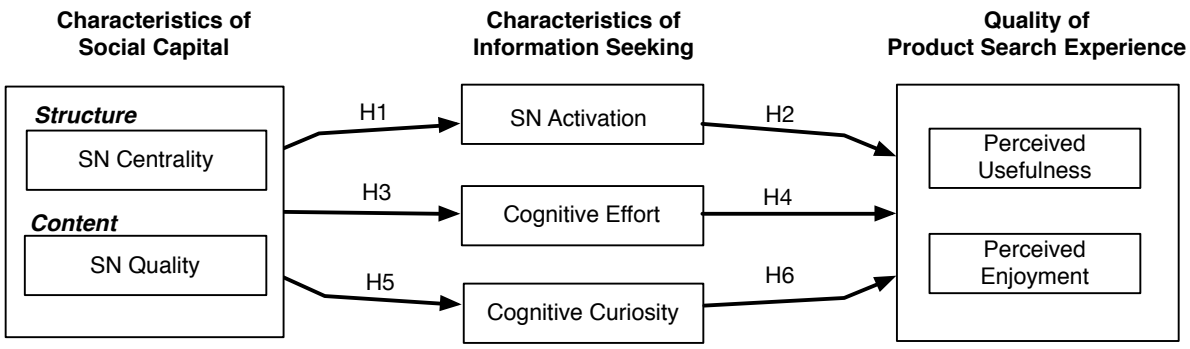
Figure 1.4 Research Model Studied in Paper #2



Paper #3 (Chapter 4 of the thesis) is entitled "***Do all roads lead to Rome? A multi mediation model for explaining utilitarian and hedonic outcomes in the context of product search within social network enabled shopping websites***". While Paper #2 focuses on the question of *if* and *under which conditions* SN-enabled shopping platforms afford superior customer experiences, Paper #3 focuses on underlying value creation mechanisms. It is important to cover both aspects in my thesis because together they provide a more complete understanding of what online social commerce entails. Specifically, Paper #3 investigates *how* (i.e., by what means) both the amount and quality of online consumers' social ties affect

shoppers' utility and enjoyment when searching for products. I theorize that SN-enabled shopping sites convey social cues at the origin of three mediation mechanisms that occur while customers use a SN-enabled shopping site: (i) the extent to which consumers evoke the informational resources created by peers in their personal network (i.e., SN activation), (ii) the level of cognitive effort that they incur, and (iii) the degree of cognitive curiosity that they experience. The choice of these mechanisms was based on a review and integration of theories of social capital (i.e., how networks generate value) and online consumer behavior (i.e., how online users respond and exploit the signals offered in online settings), and their application to the SN-enabled shopping context. The empirical study exploits the same experimental setup as for Paper #2. The research model that is being investigated is illustrated in Figure 1.5.

Figure 1.5 Research Model Studied in Paper #3



In summary, the three papers that compose this thesis answer the following research questions:

1. **Paper #1** - What are the distinctive *properties* of online social commerce environments? Which relevant *theoretical foundations* and *units of analysis* facilitate the study of online social commerce value?
2. **Paper #2** - Are *SN-enabled* shopping environments more valuable to consumers than *non-SN* ones? To which extent does this depend on the number of friends that shoppers have, and on the network boundaries (private vs. open) designed within platforms?
3. **Paper #3** - *How* do SN-enabled shopping environments yield consumer value? In particular, what are the roles of explanatory mechanisms (SN activation, effort reduction, curiosity arousal) in inducing enjoyable and useful product search experiences?

Table 1.1 provides an overview of the purpose, method, deliverables, and contributions of the three papers that compose this thesis. Chapter 5 concludes the thesis by synthesizing its contributions and limitations, and highlighting important directions for future research.

Table 1.1 Paper-Based Thesis Overview

	Paper #1	Paper #2	Paper #3
Purpose	To develop integrative theoretical foundations for the study of online social commerce. To make the case for online social commerce networks (OSCN) as a useful conceptual lens via which to study online social commerce and its value.	To examine the potential of SN-enabled settings to yield serendipitous and diagnostic product search experiences compared to non-SN ones. To explore this question in the context of two types of network designs: private (i.e., users can access friends' contributions only), and open (i.e., ability to access to all users' contributions).	To investigate how SN-enabled shopping settings yield valuable product search experiences. To focus, in particular, on three mechanisms (SN activation, effort reduction, curiosity stimulation) that are expected to mediate the relationship between consumers' social capital and consumers' perceptions of usefulness and enjoyment.
Design and Methodology	Deductions from SN, Marketing, and IS research about the nature of their focal construct (networks, IT artifacts, exchanges between consumer and business actors)	An online experiment using a custom-developed and manipulated website with restaurants as products. Subjects are embedded within their Facebook personal network. The experimental task focuses on product search.	
		Comparisons of three experimental groups: non-SN enabled, private SN-enabled, open SN-enabled	Analyses conducted on a sample of subjects that used three forms of open-SN enabled versions of the site.
Deliverables	A typology of prototypical network structures that manifest in social commerce; A framework for studying the value of social commerce from both a consumer and business standpoint.	A model that theorizes about the benefits of SN-enabled settings on online shoppers' perceived levels of serendipity and diagnosticity, contingent on how the network is designed and the size of shoppers' personal network.	A multi mediation model that theorizes about three mechanisms via which consumers' social relationships (centrality and quality) influence the utility and enjoyable nature of their product search experience.
Contribution	To clarify and provide research directions for the emerging and important domain of online social commerce. To provide a guiding framework for social commerce initiatives.	To demonstrate the value-added of SN-enabled designs compared to non-SN for two aspects of consumer value (diagnosticity and serendipity). To account for variation in network design (private vs. open) and consumers' SN size in assessing these effects.	To integrate theories of SN value with those accounting for human behaviors in interactive settings. To explain how the effect of online consumers' social capital operates through different value-creation paths triggered by the new social cues offered by SN-enabled designs.

Chapter 2: An Integrative Network-Based Conceptualization of Online Social Commerce Value (Paper #1)

2.1 Synopsis

An increasing number of businesses and consumers talk about, invest, and engage in social commerce, which has been broadly defined as a form of online commerce mediated by social media. Despite the growing recognition of social commerce as a phenomenon that is here to stay and that is strongly modifying relationships between businesses and customers, its practice is still often experimental and driven by fast-paced technological evolutions and ad-hoc business success cases. In parallel, social commerce has been the target of scattered scientific inquiries and remains ill-conceived, which constitutes a primary obstacle to theory development, cumulative research, and practical contributions. This paper sets out to address this issue by developing the construct of *online social commerce networks* (OSCNs), defined as online environments via which consumers and various types of business actors connect and interact among and between each other. The content of the proposed OSCN construct takes into account two key constituting facets of social media (i.e., they involve social networks, and they rely on information technologies) as well as the nature of the commerce context (i.e., the communication about and exchange of products and services). Building on this basis, the paper presents a set of typical network structures that manifest in social commerce, and develop a framework that depicts the value that customers and businesses can gain from creating and exploiting these structures. It is hoped that this study helps anchor the academic conversation, and assists practitioners in thinking more productively about the opportunities offered by online social commerce.

2.2 Introduction

The scope of the social commerce concept is ambiguous due (at least in part) to the fluidity and multi-faceted nature of the phenomenon it captures. Some definitions found in prior research suggest a focus on consumers, such as when social commerce is viewed in terms of "technology-enabled shopping experiences where online consumer interactions while shopping provide the main mechanisms for conducting social shopping activities" (Shen and Eder, 2011 p. 20), but others suggest a focus on sellers. For example, Stephen and Toubia (2010) associated social commerce with networks of individual sellers, and social shopping with networks of consumers. Such diversity in describing the nature of things covered by online social commerce is problematic in that it constitutes an obstacle for theory development and cumulative research (Weber 2003).

The present paper acknowledges existing efforts towards furthering our understanding of social commerce and aims to move them forward by making a case for the utility of looking into the phenomenon via a *network lens.* To do so, I develop the construct of online social commerce networks (OSCNs), defined as *online environments in which consumers and business actors connect and interact among and between each other, forming and leveraging an intricate set of interconnected digital network structures.* As I will explain in this paper, the new perspective on online social commerce that this construct affords has four key benefits. First it is systematic as the concept is developed based on a network-centered focus. Second, it is distinctive as it takes the unique nature and context of the phenomenon into account. Third, it is inclusive as it enables the consideration of multimodal network configurations (i.e., relationships between consumers and businesses) in addition to unimodal ones (e.g., relationships within each set of actors). Finally, and most importantly, it has some

utility as it helps shedding some preliminary light into the involvement of businesses and consumers in creating value for themselves as well as for each other.

The present study has two research objectives. The first one is to further our understanding of the scope and the multifaceted nature of social commerce by proposing OSCNs as a useful construct and perspective to anchor the discussion. Towards that aim, I draw from the Marketing and the Social Network literatures to identify a set of prototypical social commerce network structures, and further build on Information Systems (IS) knowledge to specify a set of information technology (IT) mediated actions that users can conduct to develop and leverage these structures. On this basis, I then address the study's second objective: explaining the potential value of these IT-mediated actions for customers and businesses and the facilitating role of the technological capabilities that support OSCNs. This objective is fulfilled via the development of a framework and associated research propositions. The framework can be used by scholars to derive more focused theoretical models to guide empirical studies, and by practitioners to reflect about their social commerce initiatives. In sum, I hope to contribute to the emerging body of research studying the nature and outcomes of digital networks (Butler and Matook 2014; Kane et al. 2014; Oinas-Kukkonen et al. 2010; Sundararajan et al. 2013), particularly those in the e-Commerce context (Goldenberg et al. 2012; Stephen and Toubia 2010; Yadav et al. 2013).

The rest of the paper is organized as follows. I first review the relevant extant literature and explain the rationale for proposing OSCN as a new conceptual anchor. I then specify the properties of OSCNs as well as consumers and business actors' interactions with them. Next, I describe the research framework of the value potential of OSCNs. Finally, I discuss the paper's limitations and contributions.

2.3 Literature Review

I start by acknowledging the research work that has been conducted since the early 2000s about the social influence mechanisms and social structures that manifest in e-Commerce. This provides a perspective for the subsequent review of online social commerce research, which emerged more recently, in the early 2010s. Finally, I portray the key differences between social commerce and three closely associated and more widely known and studied phenomena: e-Commerce, online communities, and social network sites (SNSs).

2.3.1 Social Influence Mechanisms and Social Structures in e-Commerce

Influencing or seeking others' influence is inherent to human life. Such behaviors are prevalent in e-Commerce where consumers often like to share their shopping success or disappointments (Hennig-Thurau et al. 2004), collaborate (Zhu et al. 2010), and know what other similar people have thought, bought, or said before selecting a product or service (Bonhard et al. 2006). An extensive body of work has demonstrated that a variety of social influence mechanisms such as reputation (Dellarocas 2005), popularity (Goes et al. Forthcoming), herding (Duan et al. 2009) or word of mouth and observational learning (Chen et al. 2011) are significant in the domain of e-Commerce. In that respect, consumers' product reviews have been a frequent focus of scholars' investigations, which revealed their effect on important outcomes such as consumer decisions (Bell and Song 2007), consumer surplus (Li and Hitt 2008), product sales rankings (Chevalier and Mayzlin 2006), or market efficiencies (Dellarocas 2005). A smaller set of studies has considered the role of IT-enabled social structures. For example, the visibility of a network of shoppers that shared a similar consumption pattern was shown to impact product demand, tripling the average influence of complementary products (Oestreicher-Singer and Sundararajan 2012), and the accessibility

to a network of individual sellers was identified as another key factor in driving sales (Stephen and Toubia 2010). Thus, there is evidence that social influence mechanisms and social structures matter in e-Commerce, and that IT has an important role in enabling or revealing them. Social commerce research, which I review next, is a natural extension of this body of work.

2.3.2 The Emerging Body of Work in Online Social Commerce

An exhaustive analysis of the literature (Table 2.1) conducted by searching the Business Source Complete and ABI Inform databases for relevant keywords (e.g., online social shopping, online social commerce) yielded 21 academic journal papers. The identified papers were published between 2010 and 2013. Most of them are part of two journals' special issues[10]. Five conceptual essays offer reviews and high-level frameworks. For example, Liang and Turban (2011), who define social commerce as a subset of e-Commerce that involves using social media to assist in e-commerce transactions and activities, provide illustrations of what is considered social media (e.g., SNSs, microblogs) and commercial activities (e.g., information sourcing, transaction, customer service). Wang and Zhang (2012) document the chronological development of social commerce and identify important challenges and opportunities for future research. Their descriptive review highlights the fast and scattered evolution of the phenomenon and stresses the centrality of the concept of SN for its study. L. Zhou et al. (2013) extends Wand and Zhang's (2012) framework by integrating notions of strategy, infrastructure, and fit. Kim (2013) offers a theoretical account of the conditions under which group-buying business models will survive. Huang and

[10] 'International Journal of Electronic Commerce' and 'Electronic Commerce Research and Applications'.

Benyoucet (2013) describe a set of tentative design principles that social commerce researchers would need to consider (e.g., the support of user identity creation, information sharing, social connections, and commercial activities). Finally, Yadav et al. (2013) adopt a marketing focus and define social commerce as the exchange-related activities that occur in, or are influenced by, an individual's social network in computer-mediated social environments, where activities correspond to the need recognition, pre-purchase, purchase, and post-purchase stages of a focal exchange. This view has a limited scope as it considers that the network underlying social commerce is made of social ties between consumers, to which firms remain external. Yet, it is the only study that I found to outline a set of propositions to orient future social commerce research.

The 15 empirical papers that are part of this new body of work on online social commerce cover an interestingly varied set of activities: consumer collaboration (G. Zhou et al. 2013), purchase decisions (Olbrich and Holsing 2011), sharing of shopping experiences (Liang et al. 2011), and information/product search (Goldenberg et al. 2012). They also target a diversity of social media platforms such as microblogs (Liang et al. 2011), social shopping communities (e.g., Shen 2012), social TV (Pagani and Mirabello 2011), and blogs (Ko 2013). A disappointing aspect of this literature is that few papers address the uniquely different nature of social commerce, with some notable exceptions. In particular, three studies highlighted the utility of investigating distinctive affordances of social commerce and leveraging the concept of network to marks the key difference with e-commerce phenomena studied in prior research. Olbrich and Holsing (2011) focus on new types of design features offered in social commerce sites. They find that user-generated product tags boost purchase behaviors while user-generated product recommendation lists and style boards decrease

them. Stephen and Toubia (2010) place networks at the center of their theorizing, and conceptualize social commerce networks as virtual shopping centers that create economic value by facilitating consumers' accessibility to the most central stores. Goldenberg et al. (2012) also focus on networks. They take videos as proxies for products, and investigate the effect of user-to-products networks (i.e., links that represent users' generated content about products) on users' content exploration. In this study, while users exploited a digital network, they were not part of it (i.e., they were not socially embedded).

Collectively, the studies included in this review (Table 2.2) indicate that social commerce has been considered as a relatively far-stretching phenomenon that may involve various commercial activities, be mediated by different types of IT platforms, and influence both consumer and business value. They also reveal that some ambiguity remains in terms of understanding how social commerce differs from and yet resembles well-established phenomena such as traditional e-commerce, a point I address in the next section.

Table 2.1 Literature Review of Social Commerce Research

Reference	Objective	Empirical Context	Studied Outcomes
Special Issue in *International Journal of Electronic Commerce* (January 2011)			
Liang and Turban (2011)	Present a research framework to help categorize social commerce research.	n/a (conceptual)	n/a
Olbrich and Holsing (2011)	Assess the effects of design features on consumers' purchase decision on a social shopping site.	An online social shopping community in the lifestyle domain	"Click outs" as a proxy for purchase intentions
Liang et al. (2011)	Explain the role of social support and relationship quality in influencing users' intentions to share shopping experience with friends and depend on friends for shopping	A microblogging tool (Purke)	Social commerce intentions (Intention to share with or depend an friends)
Pagani and Mirabello (2011)	Explain how consumer engagement, conceptualized in terms of two dimensions (personal and social interactive) affects the active and passive use of TV in a social Web site.	Social TV websites	Active vs. passive use of social TV.
Amblee and Bui (2011)	Examine the effect of electronic word of mouth (eWOM) on B2C Web site sales.	A digital microproducts (e.g., apps, e-books) store	Product reputation and sales
Special Issue in *Electronic Commerce Research and Application* (Avril 2013)			
L. Zhou et al. (2013)	Provide a general framework that extends Wand and Zhang's (2012) to help understand the development of social commerce research.	n/a (conceptual)	n/a
Kim (2013)	Provide a theoretical analysis of group-buying business models using economic modeling.	n/a (theoretical)	n/a
G. Zhou et al. (2013)	Analyze information diffusion in group-buying markets by looking at the impact of the social aspects of group-buying on sales.	Group-buying websites	Purchase decisions
Peddibhotla (2013)	Study the role of two types of individual motives (understanding and social-adjustive motives) in influencing frequency and volume of content contribution (user reviews).	Amazon	User contributions (i.e., product reviews)
Ko (2013)	Analyze the direct effects of self-disclosure by bloggers and the positive audience feedback they receive.	Blogging	Continuous self-disclosure

Reference	Objective	Empirical Context	Studied Outcomes
Gorner et al. (2013)	Study how to improve the modeling of agent trust in multi-agent systems that involve a social network of advisors.	n/a (simulation)	Agent trustworthiness
Studies that were not part of a special issue on Social Commerce (ranked in chronological order)			
Dennis et al. (2010)	Examine young women's motivations for adopting social shopping sites, using the Technology Adoption Model as a theoretical lens.	Social shopping site vs. traditional shopping site	Intention to use, recommend, purchase
Stephen and Toubia (2010)	Study the economic value implications of allowing individual sellers to connect their personal shops to those of other actors	A social commerce marketplace	Online store sales
Shen et al. (2010)	Study the acceptance of social shopping sites.	Kaboodle social shopping site	Intention to use
Shen and Eder (2011)	Same as above	Same as above	Same as above
Shen (2012)	Same as above	Same as above	Same as above
Goldenberg et al. (2012)	Examines how consumers find "good" content on websites where people and products are connected via user-generated links.	YouTube like website (videos as products)	Product exploration's effectiveness and efficiency
Wang and Zhang (2012)	Portray the evolution of social commerce and identify research gaps.	n/a (conceptual)	n/a
Gonçalvez Curty and Zhang (2013)	Describe the evolution of the top five e-commerce websites and their transitions towards a more social commerce orientation.	Amazon, eBay, Wal-Mart, Target, Overstock	The addition of new social features over the years
Huang and Benyoucef (2013)	Examine what features need to be considered in the design of social commerce platforms.	n/a (conceptual)	n/a
Yadav et al. (2013)	Develop a contingency framework for assessing the marketing potential of social commerce activities.	n/a (conceptual)	n/a

2.3.3 Comparing Social Commerce with Related Phenomena

While a context may be 'social' in a general sense (e.g., someone may read reviews from other consumers), this aspect is not what makes social commerce fundamentally different from previously studied e-Commerce settings. Instead, several scholars consider that social networks are the central and unique elements of online social commerce (Hennig-Thurau et al. 2013; Huang and Benyoucef 2013; Wang and Zhang 2012) and suggest the need to look at both consumers and firms' actions within these networks (Yadav et al. 2013). As I explain next, these anchors are useful for understanding the main similarities and differences between online social commerce and the phenomena that preceded it.

Social commerce differs from both traditional e-Commerce and SNSs in that it enables consumers to form digital relationships *with each other* (e.g., 'following' or 'friending' others) as well as *with commercial entities* such as products, brands, or stores (e.g., 'reviewing' a product). SNSs support the representation, nurturing, and exploitation of the former type of relationships (boyd and Ellison 2007). On the other hand, E-Commerce has traditionally focused on the latter type of relationships (consumers and products/vendors). By supporting both, social commerce facilitates new types of activities such as social product search (e.g., navigating a commercial space by looking for items that friends have liked) that are either impossible or less effective in SNSs or e-Commerce settings. In addition, while social commerce shares similarities with online communities such as those in which consumers relate through and interact around products (Kozinets 1999), it is different because while communities may involve social connections they generally do not rely on them to operate (e.g., Benlian et al. 2010; Blanchard and Markus 2004; Brown et al. 2007; Kim et al. 2012; Ma and Agarwal 2007). Table 2.2 summarizes what is similar and different

in social commerce compared to traditional e-Commerce settings, SNSs, and online communities.

Table 2.2 A Comparison of Social Commerce and Related Phenomena

Phenomena	Key Similarities and Differences with Social Commerce
Traditional e-Commerce	Similarities: Users gather around a common interest (a product domain) or activity (shopping); often enable user-generated content (e.g., product reviews) Differences: Do not display and enable traversing social connections.
Online social network sites	Similarities: Users have a profile and are connected to others; They can see and traverse their list of friends and, possibly, the list of their friends' friends. Differences: Do not focus on a product domain of interest; Do not typically enable and leverage a network in which people and businesses/products both connect.
Online communities	Similarities: Users gather around a common "object" or domain of interest. Differences: Do not inherently focus on products; Do not require users to create social connections with other users.

2.4 Moving Forward: The Concept of Online Social Commerce Networks

Three streams of research are now exploited to theorize about the social commerce phenomenon in such a way that its multifaceted nature is taken into account:

- Marketing research, which studies relationships and exchanges between and among *businesses* and *consumers* (Kotler and Levy 1969); therefore, it helps specify the types of *actors* involved in social commerce.
- Social network research, which relies on *network* as its focal construct (Burt 1980, 1992; Coleman 1988; Kilduff and Brass 2010); thus, it provides the foundations for defining the types of relational *ties* linking social commerce actors.
- Information systems (IS) research, which emphasizes the idea that *materiality* (e.g., the rules and procedures designed into a piece of software) matters (Benbasat and Zmud 2003; Markus and Silver 2008; Orlikowski 2000); as a result, it affords framing the identified social commerce structures in a *digital* context.

In the next sections, I explain how these literatures inform the specification of OSCNs as *online environments (e.g., websites, apps) in which consumers and business actors connect and interact between and among each other, forming an intricate set of interconnected digital network structures.*

2.4.1 Consumers and Business Actors in Online Social Commerce

The notion of exchange is a key factor in understanding Marketing as the reciprocal relationship between two entities (Bagozzi 1975; Houston and Gassenheimer 1987). Typical configurations for the conduct of commercial exchanges have been specified based on the nature of the actors being involved, for example, Business-to-Consumers (B2C), Business-to-Business (B2B), or Consumer-to-Consumer (C2C). Hence, *consumers* and *business actors* are the key entities involved in commercial exchanges, and an inclusive view of social commerce would require that both be considered (Yadav et al. 2013).

Consumers (offline or online) are individuals who are (consciously or not) interested in acquiring or consuming goods and services. Consumers may interact with businesses via different touch points such as the website or social media profile of (i) a corporation per se (e.g., Dell Inc.) or part of it (e.g., Dell Enterprise), (ii) its brands or product lines (e.g., Dell Inspiron), (iii) its products and services (e.g., Dell Inspiron 15R Touch), and even sometimes (iv) its brand ambassadors (e.g., Lynsey Sharp, an ambassador for Dell at the 2014 Commonwealth Games). This observation is important in the social commerce context where actors are identified via an online profile because it is possible for Dell, for example, to create and leverage multiple types of presences and relationships (Weinberg et al. 2013). Table 2.3 attests to the potential diversity of business actors that may be involved in OSCNs. Businesses actors may be present via virtual identities including the *brands* they own, the

ambassadors that represent their brands, the *products* they market. For example, Google Chrome (i.e., a product), Google Inc. (i.e., a corporation) have their own distinct identities on Facebook, and so do Nike HyperDunks shoes (a product), Michal Jordan (an athlete), Nike (a brand), or in another domain, Titanic movie (a product), Paramount Pictures (a company), and Leonardo DiCaprio (an actor). Table 2.3 also lists examples of desired consumer transactions (e.g., to buy shoes). Commercial exchanges may go beyond these transactions to facilitate activities that are pre-transactional (e.g., a consumer follows and messages Nokia to request information about the expected features of a new smart phone, a football club shares promotions with its following fans) and post-transactional (e.g., a consumer tweets about how great her new sunglasses are, a rock band shares pictures of its latest concert with fans) (Saundage and Lee 2011).

Table 2.3 Illustration of the Diversity of Business Actors in Social Commerce

	Business Actors			
Type of Products and Services	**Institutions (e.g., Company, Brand, Store)**	**Product/Brand Ambassadors**	**Products or Services**	**Examples of Relevant Transactions**
Home appliances	Nestlé (company) Nespresso (brand, stores)	George Clooney	Cityz coffee machine	Buy Nespresso Cityz coffee machines
Garments	Nike, Chicago Bulls, NBA, Footlockers	Michael Jordan	Nike HyperDunks shoes	Buy Nike Air Max shoes Buy at Footlocker store
Beauty products	Chanel	Marilyn Monroe	No.5 perfumes	Buy Chanel No. 5
Entertainment (movie)	Paramount pictures	Leonardo di Caprio	Titanic movie	Go see Titanic
Entertainment (sport)	Nike, FC Barcelona	Lionel Messi	FC Barcelona football games	Go attend FC Barcelona-Real Madrid
Information good (music)	Rough Trade Records, Arcade Fire	Win Butler	Arcade Fire's latest music album	Download or stream Mp3s
Information good (software)	Google Inc	Larry Page, Google evangelists	Chrome, Adwords	Download/use Google Chrome or Adwords software
Information good (books)	Levine Books	J.K Rowlin g	Harry Potter novel	Download or buy Harry Potter
Food and beverage	Coca Cola (company), Diet Coke (brand)	Pelé	Diet Coke cola	Buy Diet Coke cola
Transportation services	Uber	Uber brand ambassadors	Uber transportation service	Use Uber to book and pay for taxi services

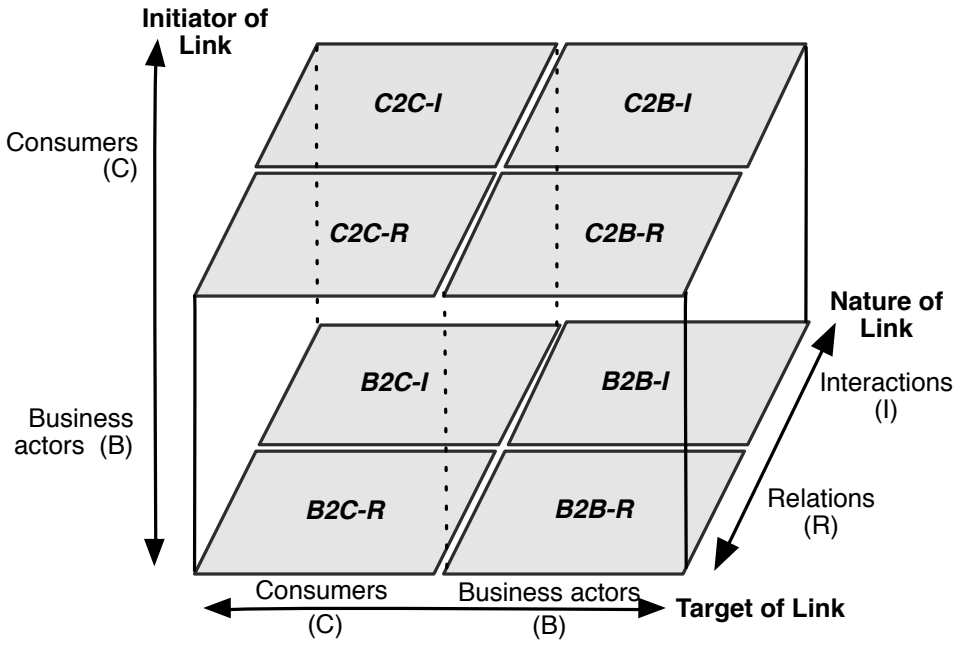
2.4.2 Type and Direction of Relational Ties in Online Social Commerce

Social network theorists view social ties (their pattern, type, content, intensity, etc.) as salient units of analysis for studying social phenomena and their emergence and consequences. For that purpose, networks are conceptualized as a set of nodes (e.g., people, organizations, events, concepts) and the ties (e.g., friendship, flows of resources) among them. In the literature on traditional interpersonal networks, several categories of ties have been examined, such as those that represent evaluations (e.g., liking someone else), formal roles (e.g., being a teacher/student of), transfers of goods (e.g., lending or borrowing something), or transfers of non-material resources (e.g., exchanging information). Hence, SN ties can be distinguished according to the type of 'content' they represent (Borgatti and Kidwell 2010; Borgatti et al. 2009) based on the idea that some ties have continuity over time while others appear more transient. In more general terms, these ties can be characterized as backcloth or traffic (Atkins 1974, 1977; Borgatti and Kidwell 2010). The former type of ties refers to the foundational infrastructure of the network, that is, stable relationships among entities (e.g., the connection of two shoppers as "friends"). As conduits for the flow of resources, backcloth links enable traffic links, which represent more transient interactional events occurring between nodes. Hence, backcloth ties provide basic connectivity and form an infrastructure of 'latent ties' (Haythornthwaite 2000), while traffic ties represent the active channels through which the resources can flow in the network. In addition to the 'content' aspect, network ties have also been characterized via their 'direction' (Garton et al. 1997) to differentiate between incoming (e.g., receiving an invitation to connect) or outgoing (e.g., requesting an invitation to connect) links. In sum, this literature suggests that the nature of ties between shoppers and businesses can be viewed in terms of two orthogonal aspects: (i)

the type of social ties: relations (i.e., backcloth) or interactions (i.e., traffic), and (ii) their direction: incoming or outgoing.

In summary, Figure 2.1 offers a typology of OSCN structures, that is, a set of network ties that can manifest in social commerce contexts (Figure 2.1). The semantics for those ties are exemplified in Table 2.4.

Figure 2.1 Proposed Typology of Network Ties Between Social Commerce Actors



Keys:

Consumers: Individuals who are (consciously or not) interested in acquiring or consuming goods and services.
Business actors: Firms, or their parts (e.g., a subsidiary), assets (e.g., brands), products, or representatives (e.g., a CEO, a sponsored athlete).
Relations: Links that form the foundational infrastructure of the network (e.g., the connection of two shoppers as "friends"), also referred to in prior work as backcloth ties or latent ties.
Interactions: Links that represent interactional events that occur between OSCN actors (e.g., a consumer "checking-in" to a store), also referred to in prior work as traffic ties.

Table 2.4 Examples of Network Ties in Online Social Commerce

Links initiated by a <u>consumer</u>	
C2C-R (relations with other consumers) Becoming friend with or following another consumer	**C2B-R** (relations with business actors) Becoming friend with or following a brand or store
C2C-I (interactions with other consumers) Congratulating a fellow consumer, sharing a product experience with consumers	**C2B-I** (interactions with business actors) Reviewing a product, checking-in to a store, sending a message to a company
Links initiated by a <u>business actor</u>	
B2C-R (relations with consumers) Becoming friend with or following a consumer	**B2B-R** (relations with other business actors) Becoming friend with or following another brand or store
B2C-I (interactions with consumers) Advising, rewarding, servicing, sending a coupon to customers	**B2B-I** (interactions with other business actors) Suggesting complementary products to another brand, commenting on a new product launch

The proposed typology offers a view of social commerce that addresses a distinctive aspect of the phenomenon (its reliance on network ties between consumers and business actors) while being generalizable given its detachment from technological implementation considerations. A complete understanding of OSCNs requires, in addition, accounting for their virtual nature (Overby 2008), a point that I address next.

2.4.3 The Role of IT in Online Social Commerce

Online social commerce environments include features that represent the IT-mediated means via which consumers and business actors create and also exploit network structures. Network creation and exploitation can, and typically do, happen concurrently, but the former is initially a prerequisite for the latter (i.e., a network must exist prior to being exploited). I consecutively describe these two types of IT-enabled actions and their link to OSCN structures next.

The *software* that underlies social commerce platforms provides an 'empty shell' with design features that users employ to feed the system with data tokens, thereby *creating* the OSCN structures. This type of use can be considered as a way for consumers and business actors to ***Connect & Engage.*** For example, consumers may use the functionalities offered by a platform to develop (e.g., via a friendship request feature) and nurture (e.g., via communication features) relationships with other consumers. This involves the formation of C2C-R and C2C-I networks (Figure 2.1, Table 2.4). Consumers may also be allowed by the platform to create relations with business actors (e.g., connect with a brand, or a store - C2B-R networks) and communicate with them or share product-related experiences or opinions about them (e.g., 'post' a comment on a product's page, 'check-in' to a store, 'like' a brand - C2B-I networks). In turn, business actors may employ platform features to connect with other businesses such as those that are partners or share similar values (i.e., create B2B-R networks), and/or with consumers (B2C-R networks). They may also leverage features (e.g., messaging, message sharing) to sustain relationships with them (B2B-I and B2C-I networks).

The *software* also processes (e.g., aggregates) user-generated data and offers features that users can employ to *exploit* OSCN structures. This type of use can be seen as a means to ***Listen and Extract.*** For example, consumers may use a feed of friends' activities to reach products, thereby leveraging C2C-R (e.g., friendships with other customers) and C2B-I networks (e.g., friends' product reviews) (Figure 2.1, Table 2.4). Business actors may also use notification features to monitor the activities of consumers to whom they are connected, thus leveraging their B2C-R and C2B-R networks, as well as customers' interaction ties (e.g., C2B-I, C2C-I). Table 2.5 and Table 2.6 illustrate how consumers and business actors may be involved in Connect & Engage, and Learn & Extract actions.

Table 2.5 Examples of Consumers' IT-Mediated Actions

Actions to CONNECT & ENGAGE	**Actions to LISTEN & EXTRACT**
Illustrative context: John created a profile on Socialreads.com last year, and started using the website to share his passion for books with friends and know what friends like and recommend.	
John started by friending Mary, another book fan and user of socialread.com. He also decided to follow his favorite bookstore (Powel bookstore in Portland) and authors (J.K Rowling and Patricia Cornwell), which have an online profile on the site. Lately, John has also used the website to review books he has read, and to check-in at his City Library when he goes there. He also uses the site to comment on his friends' reads.	*John consults the most recent book reviews that his good friend Mary's wrote in the last month. He also visits the profile page of J.K. Rowling, this very popular author that he follows, to get to know more about her novels and read the comments left by other users on her page. John is also notified when J.K. Rowling shares her newly published book on her profile page.*
John creates C2C-R (friending), C2B-R (follow), C2B-I (review, check-in), and C2C-I (comment) networks.	For each action, John leverages multiple networks: C2C-R and C2B-I (consults), C2B-R and C2B-I (visits), and C2B-R and B2C-I (notified).

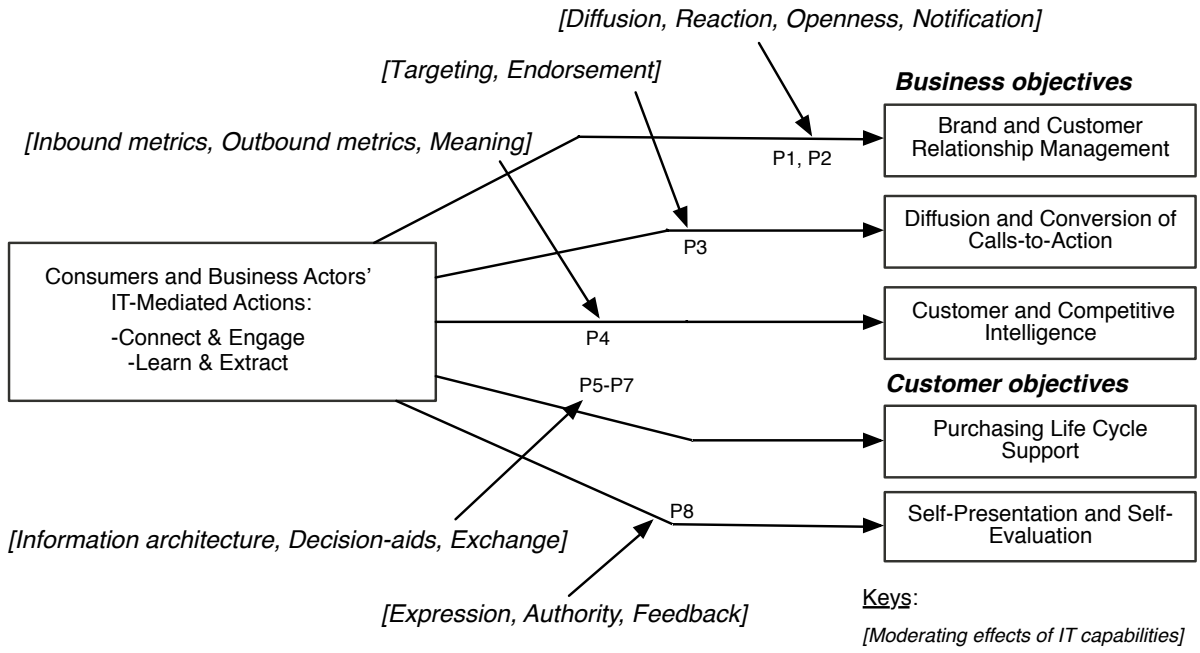
Table 2.6 Examples of Business Actors' IT-Mediated Actions

Actions to CONNECT & ENGAGE	**Actions to LISTEN & EXTRACT**
Illustrative context: BestBrew (BB) coffee shop (via Justin, its Seattle-native owner) started using the SocialCup.com site last year to gain visibility and get to know what coffee consumers like.	
Justin started friending influential consumers like Mary, and follows another coffee shop (GoodBrew) and a coffee brand (48th Parallel) located nearby. Two days ago, he wrote a note on 48th Parallel' profile page to support its latest released beans, and also apologized to a consumer who had shared a bad experience he had had at the shop. Justin often shares promotions with the people who follow him, e.g., a free muffin for each purchased cup of BB's new roast.	*Justin also consults the shop's news feed a few times a day as it displays what the other folks that the shop follows (e.g., consumers, stores) have shared (e.g., opinions, questions). He has also set up an alert feature to get warned when a follower writes a post on BB's profile page. Finally, he uses the network intelligence tools offered by the platform to monitor the level of engagement of his community of followers with the content he has shared with them (e.g., how many people consulted it and shared it with their friends).*
BB creates B2C-R (friending), B2B-R (follows), B2B-I (wrote a note), and B2C-I (apologized, shares) network structures.	For each action, BB leverages multiple networks: (i) consults: C2C-I, C2B-I, and B2B-I, (ii) warned: C2B-R and C2B-I, (iii) monitor: B2C-R, B2C-I, and C2B-I.

2.5 OSCNs and Value Creation

The preceding section explained that two sets of actors take part in online social commerce (consumer and business entities) via IT-mediated actions (i.e., Connect & Engage, and Listen & Extract) that involve the development and exploitation of OSCN structures. Building on this basis, I now develop propositions about the role of OSCN platform capabilities in moderating the relationships between these actions and the value-creating opportunities they afford to consumers and business actors. Other aspects could be studied as contingent factors, for example, product types (e.g., service vs. physical good vs. digital good), industry and firm characteristics, or customer traits and attitudes. I focused on IT for reasons of scope, and because this represents a matter that the IS discipline is best equipped to address (Kane et al. 2014). The proposed research framework is illustrated in Figure 2.2.

Figure 2.2 A Research Framework for the Study of OSCN Value



2.5.1 A Business Perspective on OSCN Value

I have identified three goals for which businesses may participate in OSCNs: *brand and customer relationship management*, *diffusion and conversion of calls-to-actions*, *customer and competitive intelligence*. Prior literature refers to the first two in terms of organizations' efforts towards enhancing relational and transactional business value, respectively (Rao and Perry 2002), and to the third as the increasing use of data intelligence as a competitive weapon for firms (Lee et al. 2014). While transactional aspects focus on improving the supply of products and services to customers, relational value emphasizes the development and nurturing of customer relationships (Fuan Li and Nicholls 2000). These are complementary views because successful organizations often strive to satisfy and leverage synergies between the short (i.e., transactional) and the longer-term (i.e., relational) exchanges with customers. Social media research suggests that if virtual customer environments can afford developing sales and other transactions, they can also support awareness, branding, and customer support (Culnan et al. 2010). In turn, information is an intermediate output that can inform relational and transactional decisions. Consumer and competitive intelligence thus capture the market insights that firms could gain from participating in social commerce networks. The potential value of these insights could be considerable (Netzer et al. 2012; Zeng et al. 2010). In the next sections, I justify why and in what respects I anticipate users' actions in OSCNs to influence the three aforementioned value-generating undertakings, and I explicate the facilitating effects of a set of technological capabilities associated with the design of network structures (summarized in Table 2.7).

Table 2.7 The Value-Generating Potential of OSCNs for Business Actors

	OSCN Use	Facilitating IT Capabilities*	Value-Generating Potential
Brand and Customer Relationship Management	Consumers' and business actors' Connect & Engage (***P1***)	*Diffusion*: make B2C-I and C2C-I visible and sharable.	Share content with and amplify positive messages from the community.
		Reaction: provide public and private support for B2C-I, C2B-I, and B2B-I.	Correct inaccuracies and deal with criticisms or complaints so they do not intensify.
	Business actors' Learn & Extract, Customers' Connect & Engage (***P2***)	*Openness:* provide channels for incoming C2B-I.	Signal a commitment to cooperate by taking inputs from other network actors.
		Notification: augment users' awareness of C2B-I and C2C-I.	Know when other network actors talk to or about them.
Diffusion and Conversion of Calls-to-Action	Business actors' Connect & Engage, Customers' Connect & Engage (***P3***)	*Targeting*: assign B2C-I to specific sets of customer (B2C-R or C2B-R).	Distribute the right messages to the right customers.
		Endorsement: link and highlight B2C-I with approvals from relevant others (C2B-I).	Attract customers' attention and interest for the calls-to-action.
Customer and Competitive Intelligence	Business actors' Learn & Extract (***P4***)	*Inbound metrics*: capture the extent and type of C2B-I.	Monitor customers' engagement with them.
		Outbound metrics: measure the reach, visibility and responses associated with B2C-I.	Monitor impact of their communications with others.
		Meaning: extract semantics embedded into C2B-I.	Know how the community feels and what it thinks.

Keys:
P1, P2, P3, P4: corresponding research propositions
* IT capabilities associated with the design of network structures (moderators in Figure 2.2)

2.5.1.1 Brand and Customer Relationship Management

Branding (i.e., the development, nurturing, and protection of a firm's image) and customer service and support (e.g., attending to customers who need assistance) are two functions for which firms can use social media environments to gain relational value (Culnan et al. 2010).

As I explain in this section, the Connect & Engage and Learn & Extract actions conducted by business actors as well as Connect & Engage actions conducted by customers in OSCNs can influence both.

Business actors can present themselves to others in the network via contributing content (e.g., posting information about new products, events). OSCN platforms may offer various mechanisms for enabling this content to be seen by others. With relatively lean mechanisms, the information that business actors create and share (which take the form of B2C-I and B2B-I structures) would remain in their profile page, such that other stakeholders would need to 'pull' that information (e.g., visit this page to obtain it). Alternatively, supplementary mechanisms can enhance the *diffusion* of such content by 'pushing' its visibility (e.g., the newsfeed on Facebook that displays what others in the network have shared) and spread (e.g., the 'retweet' function on Twitter that users can use to disseminate a message further in the network). Such functionalities have the potential to enhance brand awareness when customers use them to redistribute messages posted by business actors (C2C-I). They can also have a beneficial effect on reputation when business actors redistribute the positive messages they received from customers (B2C-I).

As customers increasingly use online media to voice their dissatisfaction (Ward and Ostrom 2006), business actors need to acknowledge and respond to their criticisms or frustrations. Rather than considering these events as threats, firms can view them as opportunities to show their responsiveness and dedication to customers (Barlow 1996; Hart et al. 1989). Effective service recovery mechanisms can alleviate the negative consequences of service failures (Tan et al. 2011). Applying these ideas to the OSCN context, I expect that business actors will benefit from being able to choose between the private and public visibility for their *responses*

to network actors' inputs in order to capture the positives of service recovery (e.g., showing professionalism and care) while avoiding the negatives (e.g., conveying a bad image). Indeed, it may be useful in certain situations to address complaints via messages that other customer could see, such as when the communication clearly denotes business actors' commitment to customer service (Bell and Luddington 2006), and when the issue can be quickly resolved (Cho et al. 2002). In other situations, criticisms or disagreements may be better resolved via private follow-ups with customers, such as when there are risks that back and forth messages about an undesired event primes negative reactions from other network actors and harms reputation (Laufer and Coombs 2006). The recovery method used to address a customer's issue (e.g., offering a rebate on future purchases) might also induce opportunism such as undue complaints from other customers (Chu et al. 1998). Hence, OSCN platforms that provide both means to respond to unhappy customers are likely to be more effective than those that only offer either one or the other. Therefore, I propose the following:

> ***P1***: The influence of *business actors' and consumers' Connect & Engage* actions on *brand and customer relationship management* is stronger for platforms that (i) augment the *diffusion* of the content they create, and (ii) offer the choice to *reply* to customers' complaints via private or more public means.

Business actors' Learn & Extract together with Consumers' Connect & Engage are also expected to influence brand and customer relationship management. Profile pages in social media networks can be constructed via inputs from the platform, the profile owner, as well as other network actors (Kane et al. 2014). When business actors enable customers to get in touch with them and contribute to their profile page (C2B-I), they indicate that they are eager to connect and listen, an attitude which has become central to business success (Tapscott and

Ticoll 2003). Like a colleague who keeps her door open rather than closed, such a behavior signals greater motivation for exposure and interaction. Thus, business actors who employ an OSCN platform that emphasizes *openness* by welcoming and channeling others' input into their profile page, convey their commitment to cooperate, which is a key ingredient to effective customer relationship management (Morgan and Hunt 1994). They also indicate their willingness to listen, which is a primary success factor in service quality (Berry et al. 1994).

Next, business actors' exposure and openness to customer inputs can be supplemented by functionalities that enable them to be *notified* of incoming messages (C2B-I) and when consumers talk about them (C2C-I). Knowing when other network actors talk to or about them is important for business actors' customer relationship management as it facilitates the monitoring and prioritizing of inbound messages, thereby enhancing business actors' responsiveness to threatening claims while reducing the number of omitted solicitations. Examples of such notification features would include alerts received when someone posts a comment to a business actor's profile page, or warnings received when someone mentions it (i.e., tagged), such as via the @ functionality on Twitter or Facebook (e.g., a consumer saying "I did not enjoy visiting @NYCAquarium today"). Hence, in addition to being present and active, and being open to customers' inputs, business actors' awareness of events that might require an action on their part appears to be another essential aspect of effective customer relationship management in OSCN. Therefore, I propose the following:

> ***P2***: The influence of *consumers' Connect & Engage* actions and *business actors' Learn & Extract* actions on *image and customer relationship management* is stronger for platforms that (i) are *open* to customer inputs into business actors' profile pages, and (ii) provide *notifications* for these.

2.5.1.2 Diffusion and Conversion of Calls-to-Actions

In addition to developing a desired image and building up relationships with customers, online marketers can also benefit from online social commerce by generating transactional value. Calls-to-action tap into the transactional side of business value as they aim to convert a user into a lead and/or, eventually, a sale (Culnan et al. 2010). In practice, they are messages that can take the form of images or links whose aim is to trigger an action from consumers that ultimately leads to a commitment, such as a registration or a purchase. The effectiveness of calls-to-action relies on several factors including the audience to whom they are exposed, the salience of the informational signal they convey, and the landing page and subsequent process via which customers may act on them. While the last aspect is out of the scope of OSCN design, the effectiveness of the first two can be improved via OSCN platforms that (i) enable the informed selection (i.e., targeting) of customers that will be exposed to the calls-to-action, and (ii) emphasize the social relevance of the message the calls-to-action convey (i.e., endorsement). As explained next, the Connect & Engage actions of business actors and customers in OSCNs can improve this transactional facet of business value.

Business actors' relations with customers in OSCNs enable the development of a highly receptive audience as these relations (C2B-R) imply an 'opt-in' or agreement by customers to receive messages from them (Godin 1999). An audience is sometimes composed of several thousands of individuals, and may therefore include customers with diverse needs and motivations. This suggests that *targeting* functionalities would be useful to distribute the right message to the right customers (Sunikka and Bragge 2009). Digital networks, including OSCNs, constitute suitable media to disseminate promotional messages (B2C-I) because

they contain, via user profiles, a vast array of customer information such as their demographics, location, education, and interests (Lampe et al. 2007). Hence, by making this information available and exploitable, platforms would empower business actors to increase the relevance of their calls-to-action by directing them to customers most inclined to be interested in what they have to offer. The selected target customers for a specific all-to-action might be those in a specific age bracket, with relevant product interests, who have already interacted with and showed interest in the products or services being offered (C2B-I), or who are friends with existing customers (C2C-R).

Individuals are often affected by those around them (Burnkrant and Cousineau 1975), and this has been observed in e-Commerce (Amblee and Bui 2011; Chen et al. 2011) and in social network contexts, e.g., in studies of ad endorsements (Chang et al. 2012). It therefore seems fair to suggest that successful calls-to-action (such as those endorsed by relevant others) could generate great value for OSCNs. This could be achieved via platform features that enable organizations to incorporate signals of approval (e.g., liked, purchased, visited) (C2B-I) into calls-to-actions from those in the target customers' network. In sum, we expect that OSCN platforms that incorporate *endorsement* features would add value by enabling business actors to leverage their audience's social relations to support their calls-to-action.

> ***P3***: The influence of the *Connect & Engage* actions of *business actors* and *customers* on the *diffusion and conversion of calls-to-action* is stronger for platforms that (i) support a detailed *targeting* of customers, and (ii) provide means to leverage and emphasize *endorsements* from relevant others.

2.5.1.3 Customer and Competitive Intelligence

Monitoring customers and other market stakeholders has become a core function of social media (Divol et al. 2012; Gallaugher and Ransbotham 2010). For that matter, companies can use an array of software to screen what is being done and said online (Laine and Frühwirth 2010). To target the right consumers, at the right moment, with the right message, and to assess the quality of their relationships with customers, business actors need to process what actors in the network are saying, thinking, doing, or feeling (Culnan et al. 2010). Thus, to be most effective, business actors in OSCNs need to engage in Learn & Extract actions that are supported by adequate analytical capabilities.

Customer engagement refers to the intensity of customers' participation in and connection with their offerings and/or activities (Vivek et al. 2012). As discussed earlier, business actors in OSCNs would benefit from tools that support customers' inbound contributions (i.e., openness) and enable their awareness of these (i.e., notification). Complementary features that enable capturing and reporting *inbound metrics* from the network about the topic (e.g., support vs. complaint), nature (e.g., general vs. specific experience), and source (e.g., tags vs. profile page) of this incoming flow of communications (C2B-I) would thus help business actors to monitor customers' engagement.

Business actors could also gain insights about customers from OSCNs by assessing the reach and impact of their own communications. For this purpose, supporting OSCN platforms would need to provide features to capture and report *outbound metrics*, i.e., analytical tools for evaluating the visibility (i.e., spread) of their contributions and the effectiveness (i.e., conversion) of their calls-to-actions (B2C-I). With these tools, business actors will be better informed to adjust the target, content, and timing of their messages.

Effective OSCN platforms should also assist business actors in detecting the emergence of trends (e.g., what are the hottest topic, the new preferred brands, the most visited stores) and moods (e.g., what and how are customers feeling), and in predicting the best messages to send customers at the best moments. Sentiment analysis, which involves examining the semantics of users' online comments using natural language techniques (Kennedy 2012), is one promising way to extract insights from the unstructured flows of communications that OSCNs engender (C2C-I, C2B-I). Sentiment analysis makes it possible to estimate the level of emotional intensity contained in informal communications on social media (Paltoglou and Thelwall 2012), and to predict real-world outcomes (Asur and Huberman 2010). Therefore, I propose the following:

> ***P4***: The influence of *business actors' Learn & Extract* actions on *consumer and competitive intelligence* is stronger when platforms provide means for business actors to (i) monitor *inbound* communications received from customers, (ii) monitor the impact of their *outbound* communications, and (iii) analyze the semantic *meaning* underlying the interactions that occur in their network.

2.5.2 A Consumer Perspective on OSCN Value

I have identified two important categories of consumer goals for participating in social commerce activities: *purchasing life cycle support* (i.e., the support to customers' purchase-related activities from need recognition to post-purchase) and *self-presentation and self-evaluation* (i.e., the expression and evaluation of one's consumer identity). These categories were considered in prior research in terms of the content being provided by a medium and the social utility involved with its use, respectively (Katz et al. 1973; Stafford et al. 2004). I explain next why customers' Connect & Engage and Learn & Extract actions as well as business actors' Connect & Engage actions have the potential to facilitate these value-

generating endeavors, and specify the moderating influence of a set of IT characteristics that pertain to the design of network structures (summarized Table 2.8).

Table 2.8 The Value-Generating Potential of OSCNs for Customers

	OSCN Use	**Facilitating IT Capabilities***	**Value-Generating Potential**
Purchasing Life Cycle Support	Consumers' Learn & Extract (***P5***)	*Information architecture*: leverage underlying social structures (C2C-R, C2B-I) to orient product search and evaluation	Identify products and services that are known and implicitly or explicitly recommended by one's social circle.
	Consumers' Learn & Extract and Connect & Engage (***P6***)	*Decision-aids*: enable soliciting and receiving others' input (C2C-I, C2B-I, B2C-I)	Request assistance or feedback from other network actors to make purchase decisions.
	Consumers' Connect & Engage, Business actors' Connect & Engage and Learn & Extract (***P7***)	*Exchange*: offer a post-purchase channel to contact a product provider (C2B-I, B2C-I) or inform other customers (C2C-I)	Share appreciation, vent negative feelings, ask for service.
Self-presentation and Self-evaluation	Consumers' Connect & Engage (***P8***)	*Expression*: offer evocative means to support identity claims (C2C-I, C2B-I).	Select self-expressive strategies to fit different contexts.
		Authority: afford a tight control over the visibility of their contributions (C2C-I, C2B-I).	Ensure that their audience is the one they anticipate.
		Feedback: afford knowing about others' reactions to contributions (C2C-I, C2B-I).	Evaluate the impact of their engagement (e.g., who or how many sees their contributions).

Keys:
P5, P6, P7, P8: corresponding research propositions
* IT capabilities associated with the design of network structures (moderators in Figure 2.2).

2.5.2.1 Purchasing Life Cycle Support

Business actors' and consumers' Learn & Extract and Connect & Engage actions may generate value at different points during consumers' purchase journey. Several models of

customers' support life cycle have been developed and used in prior research (e.g., Cenfetelli et al. 2008; Court et al. 2009; Edelman 2010; Ives and Learmonth 1984; Yadav et al. 2013). While these models differ in their details (e.g., number of stages), they concur in emphasizing the importance of the pre-purchase (i.e., becoming aware of needs, and searching and assessing alternatives) and post-purchase (i.e., sharing experiences, advocating, and getting service) stages. As I explain next, OSCNs can provide value to each of these especially via *information architecture* and *decision-aid* features that leverage social connections to facilitate shoppers' identification and evaluation of products, and via *exchange* mechanisms that support their sharing of post-purchase experiences.

Previous research suggested the utility of socially-infused online shopping environments (e.g., Hassanein and Head 2007; Wakefield et al. 2011; Wang et al. 2007) and of digital networks for product search (e.g., Goldenberg et al. 2012; Oestreicher-Singer and Sundararajan 2012). OSCNs score high on both the social and the network and seem, therefore, well positioned to help customers to identify and evaluate products. One way to achieve this is via the provision of informational spaces that support social navigation, which is the identification and evaluation of information that is being guided by the activities of others within network (Munro et al. 1999; Svensson et al. 2005). In online settings, this can be done by customers without requiring others' actions i.e., in an unobtrusive fashion (Ellison and boyd 2013). Social navigation can be expected to be most effective when the "others" guiding the search are most relevant in the context of the focal product search, something that can be facilitated in OSCNs. In fact, social relations on OCSNs are self-determined (i.e., chosen by users vs. decided by the platform), hence, connected shoppers (C2C-R) are likely to have some degree of familiarity and similarity (McPherson et al. 2001).

The product endorsements signals (implicit - 'pin', 'like', 'check-in', 'reviewed' - or explicit – 'recommends', 'favorites') (C2B-I) sent by these individuals should thus be more salient and easier to process in light of existing references. In sum, I expect that consumers will be better supported in their product screening and evaluation activities via OSCNs whose *information architecture* leverages the underlying network structures (C2C-R, C2C-I). This capability manifests via different types of features. For example, they can take the form of a newsfeed that displays the product endorsement signals of others in a customer's social circle to help focus product search on a reduced set of options advocated by the most relevant others. Other possible features are those that enforce the prioritization of one's social circle's contributions within product pages to help focus shoppers' information acquisition on the experiences reported by those that are most relevant. Therefore, I propose the following:

> ***P5***: The influence of *consumers' Learn & Extract* actions on *purchasing life cycle support* is stronger for platforms whose *information architecture* highlights products that are known and implicitly or explicitly recommended by one's social circle.

In addition to supporting the screening and identifying of products alternatives, OSCNs may support customers' product purchase life cycle by providing functions that support decision-making. Consumer decision-making has been studied in e-Commerce settings, e.g., in studies of how product recommendation agents can help customers to compare and decide among product alternatives (Xiao and Benbasat 2007). The intrinsically social nature of OSCNs offers an additional opportunity to participating customers: to get help from others in the network (Bilandzic et al. 2008). To support such function, OSCN platforms need to incorporate *decision-aid* features that leverage customers' relations (C2C-R) and channel interactions between them (C2C-I). For instance, such features could enable customers to ask

those to whom they are connected for their opinion on a product or to participate in a vote on product alternatives, or to submit private requests to specific customers for advice on a product selection dilemma. Therefore, I propose the following:

> ***P6***: The influence of *consumers' Learn & Extract and Connect & Engage* actions on *purchasing life cycle support* is stronger for platforms that enable requesting the *aid* of others for making a purchase decision.

Once customers have acquired a product, they like to share their experience using it and express whether it fulfilled their expectations (Ward and Ostrom 2006). If they had an upsetting experience, they may wish to vent their negative feelings (C2B-I) (Leung 2013), or ask the seller for an explanation or compensation. If they had a great experience, they may wish express their gratefulness to the seller (C2B-I) (Gouldner 1960), and help others by recommending the product or service (C2C-I) (Kollock 1999). Hence, OSCN's post-purchase support would seem to be improved when customers are able to *exchange* with customers and business actors about their experience using a product.

> ***P7***: The influence of *consumers' Connect & Engage* actions together with *business actors' Connect & Engage and Learn & Extract* on *purchasing life cycle support* is stronger for platforms that enable consumers to *exchange* about the use of purchased products.

2.5.2.2 Self-Presentation and Self-Evaluation

Self-presentation, i.e., the projection of a desired image to oneself and to others, is a common aspect of social life (Goffman 1959). Unsurprisingly, self-presentation is prevalent on the Web, especially in settings where individuals are exposed to an audience such as online communities (Ma and Agarwal 2007), the blogosphere (Bortree 2005), and online social

networks (Krämer and Winter 2008; Toubia and Stephen 2013). In parallel, consumption is often considered as a self-defining and self-expressive behavior (Schau and Gilly 2003), and thus constitutes a powerful context for signaling and evaluating one's identity (Slama and Wolfe 1999). Hence, given their reliance on social relationships and the consumption-oriented contexts that they represent, OSCNs can be expected to constitute attractive playgrounds for individuals to develop, evaluate, maintain, and enhance their identity as consumers. For self-presentation and evaluation activities to be effective, consumers need to ensure that they can say/show what they want to say/show (i.e., convey the right meaning), know who is part of their audience, and assess their reach and influence on others (Goffman 1959). Thus, features that afford *expression*, *authority*, and *feedback* will be important in supporting customers' Connect & Engage actions in OSCNs, as I explain next.

Previous work on impression management suggests that individuals construct and disclose their identity with care and attention (Goffman 1959) to convey an authentic or ideal representation of their self (Higgins 1987). In particular, customers use their possessions of and associations with products and brands to create their self-identities (McCracken 1990; Mittal 2006). Compared to offline contexts, customers' self-presentation endeavors in online social commerce are both enabled and bounded by the representation methods supported by online platforms (e.g., linguistic, or paralinguistic representations such as emoticons, graphical representations such as images). In addition, studies of self-presentation in digital networks showed that individuals like to adopt different strategies to construct their identifies, making use of claims that can be highly explicit (e.g., narratives), more implicit (e.g., via visuals or symbols), or a mixture of both (e.g., the enumeration of tastes and preferences) (Zhao et al. 2008). Hence, I expect that consumers' self-presentation activities

in OSCNs would be most effective when the supporting technological platform provides a rich set of means for customers to *express* themselves by both telling and showing their accomplishments, tastes, or unique creative efforts.

Having an audience is another fundamental aspect of self-presentation as the self exists only in the context of others (Markus and Kitayama 1991). Goffman (1959) explained that the presentation of self is contextual, based on a specific setting with an anticipated audience. Individuals' knowledge about their audience is more easily achieved in offline than in online settings where spatial boundaries are more fluid and digital traces of self-presentation activities more persistent over time (Palen and Dourish 2003). Hence, self-presentation involves a process of regulation between disclosure and withdrawal (Altman 1975). One way to manage audience concerns is to adjust levels of access, a strategy sometimes observed in social network sites (Tufekci 2008b). Therefore, customers' self-presentation can be expected to be more effective when OSCN platforms enable *authority*, that is, controlling and adjusting for the level of visibility of their contributions in the network.

Observing an audience's reactions to identity claims facilitates the evaluation, maintenance, and eventual modification of individuals' self-views via three key mechanisms: self-assessment (i.e., making sure what is being conveyed is accurate), self-verification (i.e., verifying the coherence between what is conveyed and how others perceive it), and self-enhancement (i.e., improving the positivity of one's self-concept) (Sedikides 1993). Providing feedback on the reach of OSCN customers' identity claims can facilitate self-assessment. For example, knowing that a lot of peers consulted the product reviews of a customer can signal this customer's popularity, which can boost his/her self-worth (Harter et al. 1998) and confirm his feeling of integration within a social group (Blanchard and Markus

2004). In turn, enabling others' responses to an OSCN customer's contribution can support self-verification. For example, a customer who would be able to know what others think about what they have shared would be able to better understand if the message he wanted to convey was well understood. That is, it would afford verifying the impression he aimed to 'give off' to others (Ma and Agarwal 2007), thus providing a sense of coherence and security (Goffman 1959). Finally, highlighting the positive aspects yielded by OSCN customers' contributions while protecting against negative feedback would support self-enhancement. For example, simple mechanisms such as indicating who 'liked' a list of favorite products created by a customer would seem valuable to stimulate self-esteem, a driver of further self-disclosure in online social networks (Christofides et al. 2009). In sum, customers who use OSCNs to convey a desired (e.g., faithful, coherent or positive) impression to others would benefit from knowing about their influence on their anticipated audience. In other words, OSCN features that enable customers to obtain *feedback* on their contributions will better support customers' self-evaluation mechanisms. Therefore, I propose the following:

> ***P8***: The influence of *consumers' Connect & Engage* actions on *self-presentation and self-evaluation* is stronger for platforms that enable them to (i) *express* themselves via meaningful textual or symbolic representations, (ii) have *authority* over who is part of their audience, and (ii) get *feedback* on the impact of their contributions on their audience.

2.6 Discussion

Research on online social commerce is at an early stage of development and its progress has been delayed by a lack of clear conceptual foundations. I have chosen to address this issue by using the concept of network as a conceptual foundation. Two complementary goals motivated this research: (1) to clarify the nature and scope of the social commerce

phenomenon, and (2) to better understand the value potential of online social commerce and the facilitating role of technological capabilities. In this section, I discuss the implications of the research together with its limitations and the opportunities it creates for future research.

2.6.1 Research Contributions

I addressed the paper's first objective by proposing the construct of OSCN as a new conceptual anchor for the study of online social commerce. OSCNs are defined as online environments in which consumers and business actors connect and interact among and between each other, forming and leveraging an intricate set of interconnected digital network structures. Drawing from the extant knowledge from the marketing and social network literatures, I categorized those networks structures in eight possible types. I then specified two kinds of IT-mediated actions via which customers and business actors create and exploit structures (Connect & Engage and Learn & Extract, respectively). Hence, in McInnis' (2011) terms, the fulfillment of this first objective provides a conceptual contribution of the 'relating' type, which includes the two aspects of differentiation and integration. The OSCN concept and associated typology of network structures were derived from clarifying the *difference* between what social commerce is and what it affords compared to related phenomena with which it tends to be confounded (e-Commerce, SNS, online communities, social networks). This should help researchers by helping them understand why results from this area may or may not be applicable in other areas, and vice versa. The OSCN concept and associated typology also emerged as a result of *integrating* key assumptions from three fields that are well equipped to inform the progress of social commerce scholarship: 1) information systems, which has developed knowledge about the study of IT capabilities and users' interactions with IT, 2) marketing, which has contributed to our understanding of interactions

among market actors, and 3) sociology, which has long studied the connections and interactions among social entities. Thus, the proposed conceptualization of social commerce accommodates extant knowledge and combines three lenses that afford a more-complete view of the phenomenon (Okhuysen and Bonardi 2011). Finally, its contribution can be further evaluated through its utility in revealing novel insights such as those related to the value potential of social commerce, a topic that was the focus of this study's second objective and that I discuss next.

The second objective of this paper was to explore the influence of the two IT-mediated actions at the core of online social commerce in fulfilling the needs of customers and business actors, and to explicate the facilitating effects of IT capabilities associated with the design of network structures. I focused on three business actors' motivations that OSCN can help satisfy: the management of their brand and customer relations, the diffusion and conversion of calls-to-action, and the improvement of customer and competitive intelligence. The analysis yielded four propositions about the influence of three IT-mediated actions (business actors' Connect & Engage and Learn & Extract, and customers' Connect & Engage) and of nine associated technological capabilities (diffusion, reaction, openness, notification, targeting, endorsement, inbound and outbound metrics, and meaning) in facilitating the fulfillment of these business needs. I then identified two key customer motivations for using OSCNs: getting support during their purchase journey, and engaging in self-presentation and self-evaluation. The subsequent analysis produced four propositions about the role of the four IT-mediated actions (business actors and consumers' Connect & Engage and Learn & Extract) and six IT capabilities (information architecture, decision-aids, exchange, expression, authority, and feedback) in meeting the two aforementioned customer

needs. Thus, in McInnis' (2011) terms, the propositional inventory yielded by addressing this study's second objective provides a conceptual contribution of the 'explicating' type as I *delineate* why and in what respects customers and business actors' engagement within OSCNs can generate value. While the propositions will need further inquiry and empirical investigations, they suggest new insights. First, they show that what could be thought of unrelated is, in fact, related. For example, it was expected that actors are likely to be impacted by their own actions, but I revealed that given their interdependency, they are likely to experience direct consequences from others' actions as well, such as when a customer requests assistance from others in her social network to make a purchase decision, or when a business actor gains brand awareness when customers redistribute his message. Second, they suggest that what could be deemed simple is, in fact, quite complex. As my framework shows, different types of actors can be connected in different ways and can conduct different IT-mediated actions to create and exploit their social connections; thus, there seem to be multiple, complex pathways to value. The propositions on the facilitating role of IT capabilities also highlight the important contingencies that can affect the value obtained.

My work builds upon but also differs from and extends past work. Gallaugher and Ransbotham (2010) studied the opportunities and risks of social-media-based customer communication, focusing on three flows of consumer communications. In doing so, they explained that social media could take the role of a 'megaphone' (i.e., when firms share their message with customers), a 'magnet' (i.e., when firms draw inbound customer dialog), and a 'monitor' (i.e., when firms capture customer insight and market intelligence). These potentials of social media are covered in my own framework via the OSCNs' capabilities related to diffusion (megaphone), openness, reaction, and notification (magnet), and inbound

metrics, outbound metrics, and meaning (monitor). The proposed OSCN perspective thus goes a step further in accounting for the value potential of social commerce for consumers. Yadav et al. (2013) investigated the influence of firms' marketing initiatives in social commerce environments on customers' purchase life cycle. My framework also covers such customer-related outcomes but also accounts for actions conducted by both firms and consumers. In addition, the resulting framework from Yadav et al. (2013) incorporated the contingent effects of product and platform characteristics, but the emphasis was more on the former given the marketing orientation of their paper. Overall, the proposed OSCN framework developed in this paper augments the existing stock of knowledge by offering a systematic and inclusive take on the phenomenon, two aspects that appeared to be lacking in prior research. It is systematic in that it is grounded in the view that networks are a foundational and distinctive notion of social commerce such that the subsequent proposed framework is developed based on this perspective. It is inclusive in that is allows for both consumers and businesses to be actors and create value for themselves and for others.

2.6.2 Practical Contributions

This research can assist companies in crafting their social commerce strategy and justify and assess the usefulness of their investments. A starting point in such an analysis would be for a firm to map the set of key actors in its business ecosystem (from consumers to partners, affiliates, competitors), and to identify what would be the opportunities from developing relations and from interacting with them. The illustrated sets of OSCN structures provided in the paper (see Table 2.4) could help specify the most relevant relations and interactions, together with the IT-mediated actions associated with these structures (see Tables 2.5 and 2.6). The proposed framework of OSCN value (see Figure 2.2) could also help map the

identified value opportunities and craft scenarios via which a firm or its stakeholders' actions would contribute to realize these opportunities. In doing so, firms would need to keep in mind that: (i) consumers' actions might impact them, and (ii) some of their own actions within OSCNs may yield direct value for themselves (e.g., connect to consumers and be able to monitor their activities and broadcast promotions) but might hinder consumer value both immediately (e.g., a consumer may not have liked to feel observed) and in the long-run (e.g., if promotions appear pushy and less relevant). Finally, the set of IT capabilities identified in the papers (see Tables 2.7 and 2.8) could be useful for firms when analyzing how best to assess, select, or create value-generating OSCN platform(s).

2.6.3 Limitations and Future Research

My perspective on online social commerce is bounded by the literature that I drew on. I felt that a fair starting point was to focus on two key market actors (customers and business actors) and two types of social ties (relations and interactions). This view is restrictive in that social ties could be differentiated further (e.g., some interactions facilitate the exchange of several types of goods such as emotional support, information, or money) and business actors could be classified with a finer level of details (as Table 2.3 acknowledged). The trade-off between parsimony and accuracy is unfortunate but usual in theoretical work and I believe that future research will be helpful in achieving the most adequate balance between both.

Another limitation comes from the focus on IT capabilities in influencing the relationship between using an OSCN and the value being produced a result, and particularly on those IT capabilities directly related to the design of network structures. The IT emphasis was chosen because our discipline is well positioned to contribute to our knowledge of IT capabilities and their value-generating potential. The focus on design aspects that related in particular to

network structures was justified by our guiding assumption about the foundational 'network' aspect in social commerce. While these choices were motivated and seem reasonable, they left other potentially important factors out of scope. Future research could identify and examine the role of additional contextual factors such as those related to customers, products, and firms. By concentrating in more detail on each part of the proposed framework, researchers could develop more in-depth and contextualized theories about the focal relationships included within their reduced scope of investigation.

Finally, the framework could be extended in several other ways. One would be to explain how the three business and two customer-related value aspects relate to each other. For example, I suggested that customer and market intelligence was an intermediary value aspect and it would be interesting to know more about its influence on the two other relational and transactional dimensions of social commerce business value. Similarly, it will be important to better understand the link and potential virtuous circle between customers' self-presentation activities and firms' relational value. In addition, while my review of the literature and my comparison to other existing conceptual contributions in the domain of social media and social commerce bring support to the relevance of the identified business and customer motivations, future research could extend these. For example, I did not consider the potential of OSCNs for satisfying other needs such as those related to the management of business partnerships or to customers' entertainment.

2.7 Conclusion

Starting from the observation that the practice of online social commerce remains ad-hoc and its scientific inquiry rendered difficult due to inconsistent conceptualizations, I set out to develop conceptual foundations for the understanding of its value potential. I made the case

for the utility of one approach that is based on the premise that a unique aspect of social commerce is its reliance on IT-enabled networks for mediating commerce, and that draws from integrated insights from marketing, social networks, and information systems research. Hence, I hope that the proposed theoretical framework of social commerce value can stand as a useful platform for future research.

2.8 Connection to Subsequent Empirical Studies

Paper #1 provides a conceptual background for Papers #2 and #3, which start addressing important empirical questions with respect to the impact of online social commerce on consumer experience. Hence, the two subsequent papers involve:

- One particular form of OSCN: online settings that rely on two types of online social commerce network structures: (i) C2C-R - consumers-to-consumers relations (Facebook's friendship ties), and (ii) C2B-I - consumers-to-business interactions (consumers' product reviews).
- One particular way of implementing an OSCN: integrating the social graph of a social network site (Facebook) into a shopping site (with restaurants as products).
- One particular task context for which to use an OSCN: customers' product search.

In sum, Papers #2 and #3 investigate OSCNs with respect to their support to *customers' purchase life cycle*, and in particular, the early stage of it (i.e., ill-defined product search). Therefore, they share a similar focus on *consumers' Learn & Extract* actions within a SN-enabled shopping site. However, they differ in that while Paper #2 focuses on the question of *if* and *under which conditions* SN-enabled shopping platforms afford superior consumer experience, Paper #3 focuses on *how* they may do so.

Chapter 3: Are Social Networks Any Good for Online Shopping? The Effects of Social Network Enabled Shopping on the Diagnosticity and Serendipity of Consumers' Product Search Experience (Paper #2)

3.1 Synopsis

As online social media becomes a prevalent channel to discover and learn about products, knowing whether such socially infused environments can enhance the quality of consumers' experience constitutes a question of increasing importance. In this study, I analyze the effectiveness of social network (SN) enabled shopping settings in facilitating product search experiences that are diagnostic (i.e., informative) and serendipitous (i.e., prone to unexpected but useful findings). I also investigate the differential effects of two types of designs applied to SN-enabled shopping platforms, those in which consumers are embedded into a SN whose frontiers are private (i.e., bounded by personal relationships) vs. open (i.e., shoppers can navigate the whole network). The findings from an online experiment that was conducted using a restaurant review website integrated with Facebook demonstrate that both private and open network designs are better able to induce serendipity compared to a traditional (non SN-enabled) design. While no such difference was observed for diagnosticity, the private network design appeared, nonetheless, to be more efficient at yielding diagnosticity (i.e., subjects could reach similar level of diagnosticity with less information). The results also highlight that private networks have an important shortcoming: the level of serendipity and diagnosticity that they generate is more contingent upon the size of shoppers' friendship network compared to open networks. This study contributes by shedding preliminary light on the effects of integrating SNs into online shopping environments.

3.2 Introduction

Individuals are increasingly interconnected via online platforms that enable them to communicate about 'objects', such as videos (e.g., YouTube), pictures (e.g., Flickr), and, of particular interest in this study, products (e.g., wine on Snooth, books on Goodreads, travel on Wayne). As they are maturing, online social media platforms are moving away from an exclusive focus on social connections to adopt a more contextual approach via which objects act as mediators of sociality (Conole and Culver 2010). For example, Facebook now makes it possible for users to connect and interact with entities such as companies, brands, and products, and even enables other websites (e.g., e-retailers) to integrate its social graph data into their own functioning. As a result of such technological advancements, online users are better able to exchange with friends about products and services that firms market on the Internet. This phenomenon is known under the general name of social commerce. In this study, I focus on one particular way social commerce might manifest, which is via social network (SN)-enabled shopping platforms. These systems support two types of network structures: (i) relations between shoppers (i.e., shoppers' SN), and (ii) interactions between shoppers and products (i.e., user-generated content, UGC) (Hennig-Thurau et al. 2013).

The benefits of online environments designed to induce perceptions or feelings that are of a social nature, such as familiarity (e.g., Komiak and Benbasat 2006), similarity (Bonhard et al. 2006), social presence (Qiu and Benbasat 2009), and socialness (e.g., Wang et al. 2007) are well-recognized in the e-Commerce literature. This body of work would seem to suggest that SN-enabled settings should facilitate more engaging and satisfying customer experience. Yet, no clear theoretical rationale and empirical evidence has yet considered the validity of this expectation. The present study addresses this gap in the literature by conducting a

controlled experiment that affords testing the effects of SN-enabled designs on two important aspects of consumers' product search experience: the understanding of products, referred to as diagnosticity (Jiang and Benbasat 2005), and the unexpected finding of useful information related to products, that is, serendipity (Foster and Ford 2003).

Another gap that this paper addresses relates to the design of digital networks. Similar to other e-Commerce artifacts such as decision aids or self-service technologies, the rules and procedures programmed into digital networks may induce different behaviors and outcomes (Kane et al. 2014). Examples of common design aspects relevant to digital networks include what's in a user profile, which type of content can be shared, or how can users connect to each other. The design of the network's scope appears to be a chief aspect in the specific context of product search as it involves selecting rules about the distance that shoppers can traverse away from their location in the SN. A narrow scope involves a strongly differentiated (i.e., unequal) access to product information. This is the case of *private networks* (e.g., Facebook), for which users can only reach the UGC created by others to whom they are directly connected. A much weaker differentiated access is afforded by *open networks* (e.g., Pinterest), for which there is no limit in traversing the network such that users can access the UGC created by any other user. On the one hand, there are apparent benefits in designing open networks, e.g., users can be exposed to a more comprehensive set of opinions. On the other hand, more information is sometimes a double-edge sword (Simon 1971) that could make product choice more complicated (Schwartz 2005). In sum, it's not clear which design is better. In addition, the effectiveness of private vs. open network scope might be contingent on shoppers' social relations because information seekers do not start on equal informational grounds in social media settings (Peters et al. 2013). That is, shoppers

are likely to benefit from different opportunities as a result of the idiosyncratic properties of the online social structure they have contributed to develop. Hence, another gap that needs to be filled in the literature is assessing the value of SN-enabled settings designed with either private or open network boundaries in light of these online social structures.

In summary, this research addresses two important research questions:

(1*) Are SN-enabled shopping settings better able than non SN-enabled ones to facilitate high quality product search experiences*, conceptualized as ones that are serendipitous (i.e., prone to unexpected findings) and diagnostic (i.e., informative)?

(2) *Under which circumstances (social network properties and platform design) are the highest levels of consumers' product search experience achieved*? That is, are certain design choices better than others depending on consumers' social embeddedness?

The structure of the paper is as follows. In the next section, I review the relevant literature to define key concepts and establish a theoretical foundation. This is followed by a presentation of a research model with associated hypotheses. I then outline an experiment simulating an online shopping environment with restaurants as products and Facebook friendships as social relationships. Finally, I discuss the results and implications of the study.

3.3 Review of Theory

3.3.1 Product Search Experience: Diagnosticity and Serendipity

Product search is considered as an ill-defined information seeking activity conducted within an online shopping environment for the purpose of identifying products of interest for consumption (Moe 2003). Hence, product search tends to be relatively exploratory, similar to informal search and browsing, and in contrast with directed activities such as querying and retrieving that are driven by specific goals (e.g., Choo et al. 1999; Marchionini 1995). Online

social commerce environments may support consumers during different episodes of their interactions with products, such as during need recognition (e.g., becoming aware of a need), pre-purchase (e.g., information search) and post-purchase activities (e.g., sharing of experience), in addition to purchase decisions (e.g., buying a product) (Yadav et al. 2013). In this research, consumers are studied in the context of a pre-purchase activity, whose success, from a shopper's perspective, can be characterized in terms of serendipity and diagnosticity, which are explained next.

Serendipity is the making of fortunate discoveries by accident or given unplanned opportunities (Beale 2007), and is a key indicator of successful online shopping experience (Iaquinta et al. 2008; Rowley 2002). Serendipity is important because, irrespective of any potential learning outcome, incidental findings are likely to stimulate consumers' curiosity and engagement, making the product search experience more exciting and entertaining, hence more enjoyable (Babin et al. 1994; Mathwick and Rigdon 2004). Yet, serendipity is not just about chance encounter and the surprise effect; it also implies running into novel information that is relevant to a focal task. Hence, a high level of perceived serendipity implies that consumers are able to obtain product-related information they did not know before and that brings an additional value to a product selection problem. While serendipity has not been at the core of traditional models of information seeking, an increasing body of research has acknowledged its relevance not only in knowledge work (e.g., Björneborn 2008; Foster and Ford 2003) and education (Kop 2012), but also in the social media (Skågeby 2012) and e-Commerce (Yi et al. 2010) domains.

Diagnosticity is another essential factor in evaluating e-Commerce environments, as it denotes their ability to facilitate product understanding, an important basis for consumers to

make informed choices. Examples of information technology artifacts whose effects on diagnosticity have been studied include recommendation agents (e.g., Xu et al. 2014), virtual product experience tools (Jiang and Benbasat 2005), and virtual model technologies (e.g., Smith et al. 2011). A high level of diagnosticity affords consumers the ability to become better attuned to the products a website offers so that they can identify those that best fit their needs and preferences. Prior research observed that perceived e-Commerce website diagnosticity positively influenced usefulness in the context of virtual product experiences (Jiang and Benbasat 2007) and decreased the level of perceived decision effort experienced by consumers using an online recommendation agent to select a product (Xu et al. 2014). In sum, an online shopping platform that is judged as highly diagnostic by its users is a desired outcome because it denotes its capacity to provide information that is indicative of products' potential performance and fit.

3.3.2 Content Access Mechanisms in Digital Networks

An important difference between traditional (i.e., offline) and online SN research is that the latter need to account for design characteristics of the IT platform supporting the network (Kane et al. 2014). In the digital world, SN-enabled environments can be designed such that they create informational spaces bounded by each member's social ties. These configurations fit the assumption often held in the study of offline networks that individuals selectively share information with some others (e.g., with friends) but not to all (Burt 2005). The selective release of information thus implies that individuals who are embedded within social structures (e.g., family, friends, professional networks) have access to an uneven pool of resources (e.g., informational, emotional). Such inequalities in the potential value of one's social ties were found to impact a diversity of individual outcomes from psychological well

being (Umberson et al. 1996) to career success (Burt 1992). Private networks are designed to fit this fundamental assumption of real life networks, in that they provide a highly differentiated access to the informational resources created by peers (i.e., UGC). Shoppers can rely on their online friends' UGC but cannot access and mobilize the UGC created by others to whom they are not directly connected.

Private networks have concrete representations in the online world (e.g., on Facebook, where users can decide to share content to 'friends' only, even to only a few of these if they wish). Some platforms even decide to constrain users to a certain network size (e.g., on Path, a user can connect to a maximum of 150 people; on Couple, an ultra-private social network, the limit is two). Nonetheless, precisely because digital networks can be 'designed', selectivity in information provision is a much more fluid assumption in these contexts compared to the offline world. Platform owners can decide to enforce the sharing of information to any other user who would care to look. For instance, Gray et al. (2011) studied an open network in the context of organizational knowledge work. As another example, the popular discovery-shopping platform Pinterest has adopted such an open model.

Figure 3.1 illustrates the different informational boundaries yielded by private and open network designs. A focal shopper who uses a private network is constrained to accessing the product-related UGC produced by other shoppers with whom she is connected on the platform. That is, "ego" in Figure 3.1 is accessing the UGC that his friends (F) have created. Conversely, ego embedded within a network designed with open boundaries is able to reach the UGC contributed by any of the other network members, her friends (F), friends of friends (FoF) but also those situated further away. Table 3.1 synthesizes key characteristics of these two designs.

Figure 3.1 Private vs. Open Social Shopping Networks

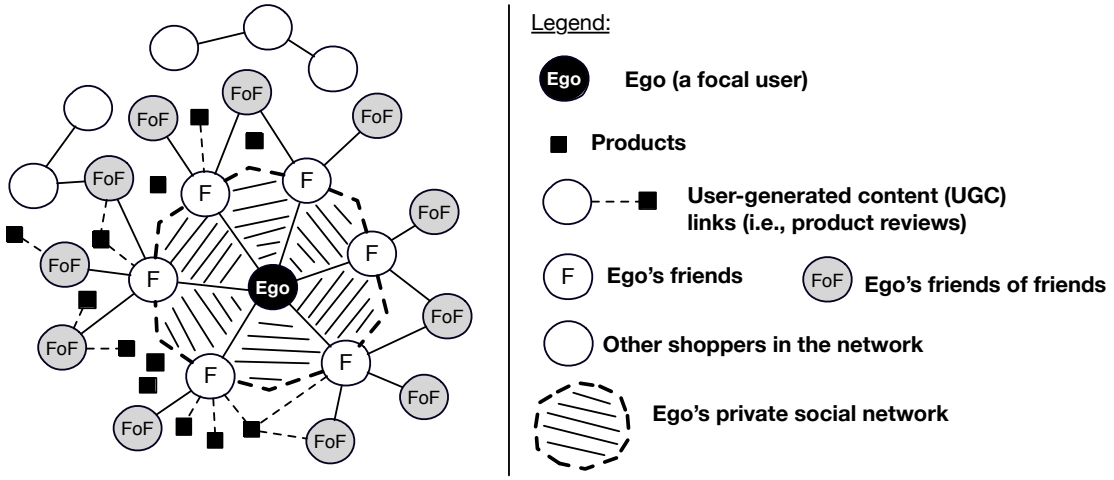


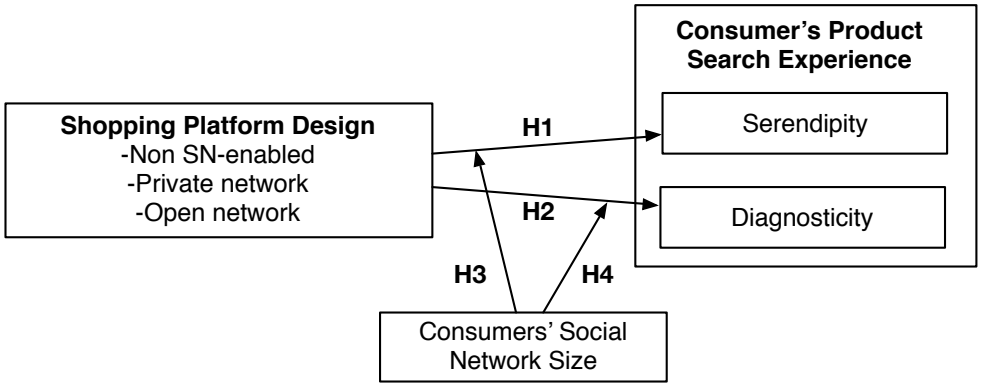
Table 3.1 Key Characteristics of Private and Open Network Designs

		UGC Release Mechanism	UGC Access Mechanism	Available Pool of Resources
Network Designs	Private	Selective (i.e., to one's personal network)	Access to resources from one's personal (i.e., first degree) network only – ego's "F" in Figure 3.1.	Highly dependent on the size of one's personal network
	Open	Not selective (i.e., to all who care to look)	Access to all the network's resources– e.g., ego's "F", "FoF" and further, in Figure 3.1.	Less dependent on the size of one's personal network

3.4 Research Model and Hypothesis Development

In this section, I explain the effects of shopping platform design on shoppers' evaluation of its ability to support serendipitous (i.e., prone to unexpected findings) and diagnostic (i.e., informative) shopping experiences. The research model is illustrated in Figure 3.2.

Figure 3.2 Research Model



3.4.1 Effects of SN versus non SN-Enabled Designs (H1 and H2)

3.4.1.1 Effects on Serendipity

Systems encourage serendipity when they enable connections, introduce the unexpected, present variety, trigger divergence, and induce curiosity (McCay-Peet and Toms 2011). Prior research observed that social settings tend to be prone to serendipity (Nahapiet and Ghoshal 1998), including those implemented online (Yi et al. 2010). We explain the influence of digital networks on serendipity by examining shoppers' information seeking behaviors. When searching for products, consumers typically go through a two-stage decision-making process. They first filter a set of product alternatives made available to them in order to identify a reduced number of products to be used as a basis for more in-depth consideration. In order to assist consumers in the initial screening phase, e-Commerce platforms can provide sophisticated decision aid software (Xiao and Benbasat 2007). Otherwise (and typically by default), they offer filtering mechanisms that enable shoppers to focus their search based on product properties that they deem important (e.g., low price, local brand). Such features tend to encourage convergent information seeking behaviors, that is, behaviors driven by set of systematic search criteria (Guilford 1967). Attributes-based filters

are the classic product search tools provided in online environments. Yet, SN-enabled environments can, depending on their design, offer supplementary content access mechanisms that encourage more divergent information seeking behaviors. For example, users can reach the profile pages of their 'friends' (a commonly used label to refer to online social ties), and consult the content they created about products (e.g., their comments, likes, recommendations, check-ins – whichever user-to-product interaction symbol(s) a platform chooses to implement). Product search behaviors that rely on others as well as others' interactions with products to navigate (i.e., social navigation) are much more opportunistic in contrast to navigation that relies on pre-established product preferences (Munro et al. 1999). In turn, serendipity has been associated with divergent behaviors in both offline (Björneborn 2008) and online settings (McCay-Peet and Toms 2011). Product search in SN-enabled shopping settings should therefore be prone to less directed / more divergent information-seeking behaviors than in settings that provide attributes-based filtering mechanisms only. Hence, I propose the following hypothesis:

H1: SN-enabled shopping environments generate more serendipity than non SN ones.

3.4.1.2 Effects on Diagnosticity

Shopping platforms improve diagnosticity by providing information (e.g., UGC) that helps shoppers identify which products are most capable of satisfying their needs, preferences, and anticipated utility. In an online shopping context, UGC is habitually understood in terms of product reviews, i.e., a type of product information created by users based on their personal usage experience (Chen and Xie 2008). The literature has documented the utility of product reviews in facilitating online shoppers' search for products (e.g., Kumar and Benbasat 2006;

Schindler and Bickart 2012), but it has also noted that the source (i.e., the author) of product reviews was an important factor moderating this effect.

For example, there is evidence that reviewer identity disclosure increases reviews' usefulness (Forman et al. 2008). In fact, consumers assess the informational value of the messages they are exposed to not only via a systematic analysis of its content, but also via attending to more peripheral cues such as its source (Petty and Cacioppo 1986). Source credibility enhances review credibility (Man Yee Cheung et al. 2009), and more generally, the value of the message being communicated (Pornpitakpan 2004). Competence and trustworthiness are two commonly identified dimensions of credibility (Hovland et al. 1953). In the context of product reviews, the former refers to the perceived degree of capability of the review's author in generating opinions or recommendations, and the latter is about the level of confidence one has about the author providing an objective and honest review.

Competence and trustworthiness are two aspects for which SN-enabled shopping settings would appear to have an edge compared to non-traditional ones. SN-enabled shopping settings make social structures visible and emphasize the presence of social connections. Depending on users and on how the platform is designed, these social connections may represent various types of relationships, e.g., those with family, colleagues, real life friends, or exclusively online friends (Mesch and Talmud 2006). Hence, while some variance might exist in how competent and trustworthy social connections are, they can be generally expected to be better able to convey these perceptions compared to other users who are not part of one's set of personal connections. This is because those to whom a shopper is connected to in a digital network are chosen by this shopper and should therefore exhibit characteristics, such as familiarity and similarity, which are conducive to competence and

trustworthiness. This expectation is informed by the homophily principle, according to which similarity breeds connections (McPherson et al. 2001) and by prior e-Commerce research that documented the effect of familiarity on trust (Komiak and Benbasat 2006). For example, it is easier to assess someone's capability to advise products that I might be interested in if I know that this person has similar tastes and/or is able to provide recommendations that could fit with my needs and expectations. In sum, friends' UGC, i.e., the content created by the individuals to whom a focal shopper is connected, is likely to be easy to process and personally relevant. Therefore, I posit that SN-enabled shopping platforms, which incorporate and emphasize UGC from friends, have an advantage over traditional shopping sites when it comes to diagnosticity, by emphasizing informational content that familiar others have shared.

H2: SN-enabled shopping environments generate more diagnosticity that non SN ones.

3.4.2 The Interaction Effect of Design and SN Size (H3 and H4)

The navigational and informational cues that manifest in SN-enabled shopping settings, which I described in the two preceding sections, need to be sufficiently salient for their effects on serendipity (i.e., inducing social navigation) and diagnosticity (i.e., offering access to more relevant information) to be most effective. Shoppers connected to just a few friends may not experience any meaningful difference when using a platform designed with or without SN capabilities. Conversely, the difference should manifest more strongly for shoppers embedded within a large network of friends (H3a, H4a). Furthermore, in private networks settings, the potential for value is strictly dependent upon the resources available within the social structures in which a consumer is located. That is, although users of open social shopping networks can counterbalance a small SN size by navigating outside of the

boundaries of their personal connections (e.g., consult friends of friends' opinions), this opportunity is not offered in private networks. Hence, private networks are likely to be more detrimental to shoppers that are not highly connected compared to open networks (H3b, H4b). On the contrary, consumers embedded within larger social structures should be able to reach similar levels of diagnosticity and serendipity whichever type (private or open) of network design they use (H3c, H4c). In other words, I expect that the effect of platform design on consumer value should be contingent on consumers' SN size. Therefore, I propose the following three sets of hypotheses about the contingent effects of network design and SN size on serendipity and diagnosticity.

H3a and H4a: SN size positively influences serendipity (H3a) and diagnosticity (H4a) more strongly in private than in open networks.

H3b and H4b: Subjects with low SN size will experience less serendipity (H3b) and diagnosticity (H4b) when they are in a private network compared to an open network.

H3c and H4c: Subjects with high SN size will experience similar levels of serendipity (H3c) and diagnosticity (H4c) in the private and open networks.

3.5 Research Method

3.5.1 Overview

The methodological approach was designed so that it would create a context for testing the validity of the proposed research model, i.e., for measuring constructs and effects in a way that enables the theory to be potentially disproved. To achieve this aim, I created a *randomized* experiment that would provide the flexibility to *manipulate the design* of the online shopping environment. With this theoretical priority in mind, the choice of methodological procedures was also based upon the objective that the empirical context

would strongly *correspond* to what can be found in the 'real world'. For that matter, the created setting mapped to the reality in two main aspects: (i) the website was a close approximation of a real life setting by providing common features (e.g., liking and tagging products, incorporating Facebook's SN), and (ii) the experimental procedures enabled participants to use the website within their natural setting[11] (i.e., not in a research lab).

Given the state of constant technological evolution in which social media researchers operate, there is a need to specify the properties of the artifacts being evaluated with "as much detail as ethnographers use when describing their field site" (Ellison and boyd 2013, p. 166). Hence, a complementary description of the custom-developed environment designed for the purpose of this study is provided in Appendix A (preliminary setup), and Appendices B to D (experimental procedures), all of which are referenced at relevant places within the forthcoming sections.

3.5.2 Experimental Environment

3.5.2.1 Restaurants as Products

This study was part of a larger project for which an experimental platform called My Table was created. The focal products being showcased on the site were restaurants in a North-American city of 2 million inhabitants (referred as City in the rest of the paper). Restaurants were chosen for three main reasons: (i) a *methodological* one - because looking for information online about restaurants is a common task (Rainie et al. 2011) and therefore enhances the study's ecological validity, (ii) a *theoretical* one - because social shopping settings should be more relevant for experiential than for search products as the former (e.g.,

[11] The website prevented participants from using tablets or mobile phones

games, holidays, music, and restaurants) tend to involve information asymmetries that induce consumers' reliance on products' extrinsic attributes, such as, others' opinions for assessing products' quality (Huang et al. 2009), and (iii) a *pragmatic* one – because restaurants are high-involvement products for which consumers like to spend some time searching for information (Gu et al. 2011) and they are likely to be relevant to a broad portion of the population cross many different categories of gender, ages, professions, etc., thereby facilitating the recruiting of subjects[12].

The list of a popular restaurant festival in City (239 restaurants) was used as a basis for the list of products to be included in the study. After informally testing the site with people at my university, a few additional restaurants from two neighborhoods that appeared to be popular and yet uncovered by the festival were incorporated to the initial list. Restaurants serving the most popular food types in City were also added, yielding a *total of 287 restaurants*. While this list only represented a fraction of the total set of City restaurants (more than 2000), it ensured a reasonable coverage in terms of location (14 neighborhoods were represented), food types (33 of them), and prices (a mix of cheap, moderately priced, higher priced, and fine dining locations).

3.5.2.2 Facebook Integration

The site was integrated with Facebook, using its set of APIs. This enabled incorporating *Facebook friendship connections* into my site, and to develop features based on them (e.g., show a user the list of her friends or the list of restaurants that her friends reviewed). Facebook has more than one billion active users and is the major enabler of SN-enabled

[12] The 2013 Local Consumer Review Survey (2100 respondents in the US, Canada, and UK) found that restaurants was the category that attracted the most searches from online consumers.
http://www.brightlocal.com/2013/06/25/local-consumer-review-survey-2013/#business

online applications thanks to its 'Platform', a software eco-system via which any third-party developer to connect their services to Facebook's social graph[13]. Hence, it was chosen as a way to integrate my shopping site with subjects' social connections (i.e., Facebook friends).

3.5.2.3 Preliminary Stage: Creating the Shopping Network

The My Table experimental platform took the form of an integrated two-modules website. The first module was used in a preliminary phase of the project (conducted in February-March 2013) to recruit participants and get them to create content about restaurants (i.e., by writing reviews).

Participant recruitment and incentives. The project was advertised as widely as feasible to the relevant population (City adult residents interested in food and restaurants) using offline and online social media. Participants automatically entered into a raffle context for which they were given the chance to win an iPad Mini and one of ten $50 City restaurant vouchers. They received one lottery ticket for taking part in the preliminary phase of my study, and were able to increase their number of tickets by (successfully) referring the study to their Facebook friends, and by participating in the experimental phase. Appendix A.1 provides complementary details about the study's recruitment and referral procedures.

Preliminary task. Social connections were captured when users signed-up to the site as they granted access to the Facebook App, which recorded their (and their friends') Facebook ID. As a result, the social network on My Table was not chosen and made up by participants when they signed up for my study, but resulted from existing Facebook friendship connections among all the My Table users. Hence, a first purpose of the preliminary phase

[13] For example, the popular provider of video rental services Netflix integrated its site and mobile applications with Facebook in March 2013. http://news.cnet.com/8301-1023_3-57574027-93/netflix-facebook-hook-up-in-u.s-at-last/

was the creation of a network of *interdependent* shoppers *connected to products* (via their reviews) that formed a pool of individuals from which to sample during the subsequent experimental phase. A second purpose was to measure the SN size variable as well as some control variables (e.g., demographics) Appendix A.2 describes and illustrates the workflow of My Table users during this preliminary task.

Resulting network structures. The preliminary phase yielded a *social network* composed of 404 restaurant reviewers who were friends, on average, with 3.5 other users. The network was composed of a large main component (the subset of the network that is fully connected) including 314 people; few of them very well connected (e.g., 6 users had more than 15 friends), and many others had few connections (e.g., 90 users had one friend, 74 two friends, 44 three friends). Additional details about these network metrics are provided in Appendix A.3. Overall, they show that the obtained social network structures appear to be *representative* of those typical of digital networks. The preliminary phase also yielded a *shoppers-by-product network* that represents participants' restaurant reviews. Participants rated on average 15 restaurants, recommended 7.5, provided 73 tags, and wrote 1.9 open comments. Additional descriptive statistics are provided in Appendix A.4. Overall, they show that the obtained the list of products was *relevant* to my sample (only 5 restaurants were unknown to all users), and that participants were *representative* of the population of Vancouver restaurant goers (as all types of restaurants – irrespective of their neighborhood, price bracket, and food type – obtained reviews).

3.5.3 Experimental Procedures

The second module of the My Table experimental platform made use of the data (restaurant reviews and social relations) created during the preliminary phase, and constituted the setting

for the experimental phase, which was conducted between May and July 2013. The purpose of the experimental phase was to assign shoppers to groups exposed to shopping environments designed with a varying set of features matching the types of design configurations addressed in this research, and to capture measures corresponding to consumers' social embeddedness and the quality of their product search experience.

3.5.3.1 Network Sampling

Stratified random sampling was used to obtain experimental groups that were balanced in terms of subjects' SN size (i.e., comparable averages and distributions). Stratification consists in dividing members of a population into non-overlapping homogenous subgroups before sampling. Thus, I split all eligible members from the network created in the preliminary phase (352 people[14]) in six strata: one including all isolates (53 of them) in the network (i.e., those with no social connections), three with subjects with one (80), two (63), and three (40) friends respectively, a fourth one with (50) subjects connected to four or five friends, a fifth one including those (50) that had between six and 11 friends, and a final stratum with (16) subjects connected to more than 12 friends. Hence, all eligible network members were assigned into one stratum from which I subsequently randomly sampled to contact and assign selected subjects to the experimental groups. This method of sampling participants from an existing network was used in prior work (e.g., Gray et al. 2011), and does not modify the social environment. Indeed, even if only a subset of subjects conducts the experimental task, the whole network's information remains potentially (i.e., depending on experimental treatments) available to them.

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[14] Among the 386 people who participated to both the restaurant review and survey in the preliminary stage of the study, 34 participants either did not allow us to contact them again or were identified as survey speeders.

I re-contacted the selected My Table members using the MailChimp email delivery service provider that complies with anti-spam international regulations[15]. A copy of the email template used for this purpose is provided in Appendix B. In order to increase response rates, I applied principles from the Dillman Total Design Method, such that I systematically followed-up with people who had not replied (i.e., participated), using emails sent on a weekly basis over a month period (Hoddinott and Bass 1986).

3.5.3.2 Experimental Task

The link provided in the aforementioned email redirected participants to the second module of the My Table site. As they had already granted access to my Facebook App in the preliminary phase, participants logged in using their Facebook credentials and were directly taken to the task description page. This process and relevant pages are illustrated in Appendix C.

The task consisted in browsing the site and filling in a 'wish list' of new restaurants to try out in the future. To reduce the extent of predetermined choice[16], I first asked subjects to write down their 'mental wish list' of restaurants they could think of for trying out in the future. Next, I disclosed the task: a selection of at least three restaurants that (i) they had not reviewed in the study's preliminary phase (the website design prevented them from doing so), and (ii) they had not added to their mental wish list (I manually checked that this did not happen). Subjects were asked to browse the site to search for new restaurants to try out, filling a wish list to validate their selection and proceed to the questionnaire. The restaurant

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[15] http://kb.mailchimp.com/article/what-is-required-to-meet-your-terms-of-use-and-the-can-spam-act

[16] Some consumers know or recognize the products they want – this has been reported in prior research (e.g., Senecal et al. 2005; Todd 2007) and is likely to happen in my context because the 'shopping' and 'consumption' of restaurants is more recurrent than the purchase of an item that one would keep (such as a bag, a camera, a piece of clothing)

vouchers used as incentives were redeemable at the restaurants identified in the mental wish list as well as those selected during the task.

Before starting their task, each subject had to examine a brief tutorial (customized to the three experimental conditions) that illustrated the website's key features and interaction elements (Appendix D). This was done to ensure that the participants would understand the possibilities afforded by the website. No pre or post-test was given, but the manipulation check analysis (reported in section 3.6.2) verified the effectiveness of this tutorial.

3.5.3.3 Design Manipulations

By default (i.e., in all conditions), the website enabled subjects to filter restaurants according to two descriptive attributes (location, cuisine) and to access product reviews in either a restaurant page or a user page. In addition, subjects in the two SN-enabled conditions could see and traverse relational ties (list of friends), and could also see a list of products that had been reviewed by their friends (social feed). A social feed presents a list of past interactions between shoppers and products (e.g., product X was reviewed by shopper Y) (Indratmo and Vassileva 2012), and is a typical content access mechanism in online networks (Ellison and boyd 2013). Table 3.2 offers further details about how the SN-enabled conditions were implemented, based on the description of social media networks' features offered in Kane et al. (2014).

Table 3.2 Social Media Network Features on the My Table Platform

SMNs Features (Kane et al. 2014)	**Description** (Kane et al. 2014)	**Implementation in The Context of My Table's SN-Enabled Conditions**
Digital profile	The platform provides a unique user profile that is constructed by the user, by members of their network, and by the platform	User profile pages include users' Facebook profile picture, their first name, and their connections to products (i.e., the restaurant reviews they created)
Relational ties	The platform provides mechanisms for users to articulate a list of other users with whom they share a connection	The social relations are Facebook friendships (i.e., they are symmetric). Users cannot create new connections (relations are 'imported' from Facebook).
Search and privacy *(manipulated)*	Users can access digital content through and protect it from various search mechanisms provided by the platform	Users can reach products via a social filtering mechanism (social feed) Users can access all content created by others (open nets) or only the content that friends created (private nets)
Network transparency *(manipulated)*	Users can view and traverse their connections and those made by others on the platform	Users can traverse the list of their friends (private and open nets) and other users' list of friends (open nets only).

In the experimental setting, the *private network* condition constrained users in reaching only the consumers and resources located within their personal network (i.e., consumers that are their Facebook friends, and these friends' restaurant reviews, respectively). The *open network* condition gave access to all consumers and all resources (i.e., restaurant reviews) present in the network, and enabled users to freely traverse the whole network by showing users' list of social connections in their profile page. A third version of the site was designed with *no SN integration*, i.e., similar to a traditional shopping site (such as Amazon). Similar to the open network treatment, all products, consumers and resources were accessible via basic filtering tools (i.e., filter restaurants by neighborhood, cuisine) but no support for social navigation was provided and users' list of friends was not displayed. In sum, the design treatments were operationalized as described in Table 3.3. Supplementary illustrations of the key features manipulated for the purpose of this study are provided in Appendix E.

Table 3.3 Operationalization of the Design Treatments

Treatments	Manipulated Features
Non SN (control)	• Subject's profile page: does **not** include a list of her social connections. • Product filters: attribute-based filtering (show restaurants organized by neighbourhood and by cuisine). • Any other shopper's profile page: the subject **cannot** see the list of their friends. • UGC: the subject can access reviews created by any other shopper.
Private network	• Subject's profile page: includes a list of her social connections (Facebook friends that are also users). • Product filters: attribute-based filtering + social feed (show restaurants that friends have reviewed). • Any other shoppers' profile pages: the subject **cannot** see and traverse the list of friends of other shoppers. • UGC: the subject can access reviews created **by their friends only.**
Open network	• Subject's profile page: includes a list of her social connections • Product filters: attribute-based filtering + social feed. • Any other shoppers' profile pages: the user can see and traverse the list of friends of all other shoppers. • UGC: the subject can access reviews created by any other shopper.

3.5.3.1 Measures

Dependent variables. In order to measure *serendipity*, defined in this research as the extent to which consumers believe that the online platform induced new or unexpected ideas or information about products, I used the existing literature (McCay-Peet and Toms 2011; Yi et al. 2010) to develop three general items that capture users' general evaluations about *the platform's ability* to encourage serendipity. *Diagnosticity* was defined as the degree to which consumers believe that the online platform informed them about how products are likely to satisfy their needs and interests. I measured it by adapting items from Smith et al. (2011) who studied the 'feeling informed' construct. Feeling informed is a belief that one understands how the product information (objective and subjective) provided in an e-Commerce site affects the consequences of using, consuming, or owning a product. Given

this study's focus on UGC (i.e., shoppers' opinions on products versus objective product characteristics), I integrated aspects of the *self* (i.e., fit with needs) and *time* (anticipated utility) dimensions, leaving the third and last *item* dimension (i.e., product properties) out.

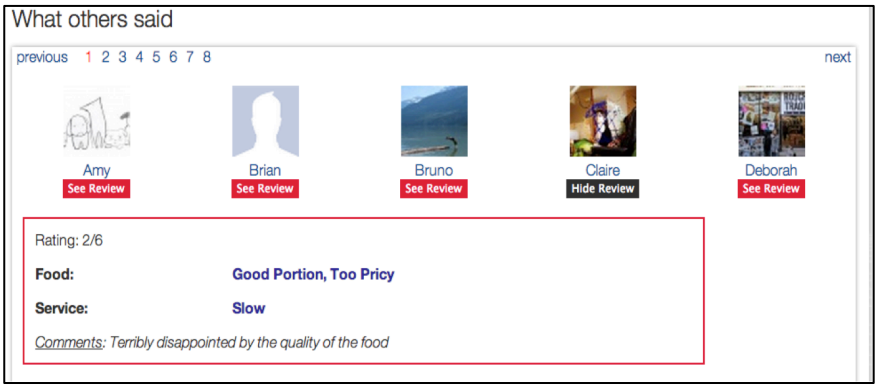
Table 3.4 Variables Measurement

Construct	Measures
Variables measured via objective platform issued data	
SN size	The number of subjects' Facebook friends on the My Table website.
Variables measured via self-reported perceptions (scores were reported on seven-points scales: from disagree strongly to strongly agree)	
Serendipity	***The My Table website…*** -Triggered unexpected encounters with restaurants that seem worth a try. -Provided some surprising yet interesting ideas of restaurants. -Delivered unexpected but useful findings about restaurants.
Diagnosticity	***The My Table website…*** -Informed me about the extent to which the restaurants might be able to meet my expectations. -Informed me about ways in which the restaurants might satisfy my preferences. -Informed me about benefits I might experience if visiting the restaurants. -Informed me about the experience I could expect when visiting the restaurants in the future.

Consumers' SN size was operationalized via the number of direct social connections (i.e., Facebook friends) possessed by the participating shoppers on My Table.

Control variables. I measured the following control variables: the extent of user-generated content (*UGC*) consumed by subjects, and the number of products viewed (*PV*) during search. UGC was operationalized via a computer script that counted the number of restaurant reviews consulted during the task. This count was based on the activation (i.e., click) of a "see review" button that displayed the selected review (see Figure 3.3). PV was operationalized via a script that counted the number of (unique) product pages visited during their search session.

Figure 3.3 Method Used to Measure UGC: the "See Review" Button



3.6 Data Analysis and Results

3.6.1 Study Sample

A total of 146 participants were contacted from the My Table network based on the aforementioned network sampling procedures (section 3.5.3.1). Among them, 39 did not answer my call to participate and 10 provided unreliable answers, yielding a sample of 97 data points for analysis that secured enough power for the purpose of my hypothesis tests[17].

To ensure that the random group assignment procedure was successful, the experimental groups were compared on a set of demographics variables (e.g., age, gender) as well as the stratified network size variable (i.e., number of friends on My Table). The results showed no significant differences between the three groups for *age* [$F_{(2, 89)} = 1.9$, $p = 0.16$], *gender* [$\chi^2_{(2, N=95)} = 0.54$, $p=0.76$], *occupation* [$\chi^2_{(2, N=96)} = 0.57$, $p=0.75$], *frequency of eating out* [$F_{(2, 91)} = 0.65$, $p = 0.53$], *number of friends on Facebook* [$F_{(2, 94)} = 0.82$, $p = 0.45$], and *number of My Table friends* [$F_{(2, 94)} = 0.44$, $p = 0.64$]. Descriptive statistics for those variables are reported in Table 3.5.

[17] To detect a medium effect of 0.15 at a power level of 0.80, a multiple regression test with 4 independent variables requires N=85 (Faul et al. 2007).

Table 3.5 Sample Descriptive Statistics

	Treatment Groups			
	Non-SN (N=28)	**Private Network** (N=35)	**Open Network** (N=34)	**Total** (N=97)
Age avg (std)	25.4 (6.7)	29.3 (9)	28.2 (7.4)	27.8 (8)
Gender				
male	30%	33%	38%	37%
female	70%	67%	62%	63%
Occupation				
non students	46%	53%	56%	51%
students	54%	47%	44%	49%
Eat out frequency* avg (std)	4.37 (1.2)	4.06 (1.04)	4.3 (1.2)	4.23 (1.14)
# Facebook friends avg (std)	393 (248)	480 (304)	423 (272)	435 (277)
# Friends on My Table avg (std)	3.07 (3.3)	4.09 (4.9)	3.91 (4.8)	3.73 (4.5)

* The eat out frequency variable was assessed via the following item and scale: *How frequently do you go out for lunch or dinner in Vancouver*: (1) Never, (2) Less than once a month, (3) Once a month, (4) A few times a month, (5) Once a week, (6) A few times a week, (7) Everyday.

3.6.2 Validation of Experimental Manipulations

The validity of the experimental manipulations was assessed by testing their effectiveness in inducing subjects' awareness about key actions (e.g., navigation and access to product reviews) made possible by the websites (the design elements present across the experimental groups are listed and illustrated in Appendix E). The descriptive statistics of subjects' answers to five questions capturing these perceived affordances (MC1 to MC5) are presented for each condition in Table 3.6. I ran MANOVA/ANOVAs (to compare mean differences between groups) followed by post-hoc comparison tests to analyze specific paired groups

against one another[18]. The detailed results of the ANOVA, Welch's robustness, and post-hoc tests are reported in Appendix F.

Table 3.6 Descriptive Statistics (Manipulation Check Variables)

Treatment Groups / Variables	Non-SN N=28		Private Network N=31		Open Network N=31	
	Mean	STD	Mean	STD	Mean	STD
MC1	**5.61**	0.84	**5.65**	1.25	**5.81**	1.22
MC2	**5.74**	0.96	3.29	1.79	**5.58**	1.43
MC3	4.09	0.90	**5.84**	1.19	**6.26**	0.93
MC4	4.04	0.88	4.03	1.40	**5.06**	1.50
MC5	3.91	0.67	**5.39**	1.36	**5.52**	1.21

Notes:

-Total N for those analyses = 90 (97 – 7 isolates in the SN-enabled groups).
-In bold: values are expected to be high.
-The items took the form of 7-point Likert scales with anchors from "1. Definitely not" to "7. Definitely yes" and introduced by the following question "Does the My Table website make it possible to..."
MC1 (attribute filtering): Filter restaurants according to neighborhood or cuisine preferences.
MC2 (availability of content): See restaurant reviews written by people I did not know.
MC3 (list of friends): See a list of my social connections (i.e. my friends).
MC4 (list of friends' friends): See my friends' social connections (i.e., their friends) in their profile page.
MC5 (social filtering): Filter restaurants to display those that my friends reviewed.

MANOVA. A MANOVA was first performed to detect whether the experimental groups differed along a *combination* of the five dependent variables utilized to capture subjects' perceived awareness of the relevant design affordances provided by the My Table platform. MANOVA is appropriate in my context as a preliminary analysis because, as an overall multivariate test, it takes into account the relationships (correlations) between multiple dependent variables (Huberty and Morris 1989), and, in that sense, it protects against inflated Type-I error rates. The p-values obtained from the Pillai's trace, Wilks' lambda, Hotelling's trace, and Roy's largest root MANOVA tests were all found to be significant (p=0.000).

[18] In addition to attending to level of homogeneity of variance between and the sample size of the compared groups, I made sure that the five dependent variables were reasonably normal by assessing the degree of skeewness and kurtosis in their distribution; all were inferior to 1 or to twice the standard error, and therefore considered normal (Tabachnick and Fidell 1996). I also removed 7 cases that were isolates (i.e. subjects with zero friends on My Table) as they would distort the average perceptions of affordances for subjects in SN-enabled groups.

Thus, this analysis was followed-up by a set of ANOVAs conducted separately on the five dependent variables.

ANOVA. As the three designs enabled the filtering of restaurants by their cuisine or location, no significant between-subjects difference was anticipated across groups for this baseline variable (MC1); this expectation was corroborated by the ANOVA results [MC1 - $F_{(2, 82)}$ = 0.24, p = 0.78]. The results further indicate significant differences in how participants perceived their ability to reach content produced by non friends [MC2 - $F_{(2, 82)}$ = 25.24, p = 0.000], to see a list of their friends [MC3 - $F_{(2, 82)}$ = 32.09, p = 0.000], to see lists of their friends' friends, [MC4 - $F_{(2, 82)}$ = 5.93, p = 0.004)], and to filter restaurants that their friends reviewed [MC5 - $F_{(2, 82)}$ = 15.05, p = 0.000]. Welch tests reported in Appendix F provide supporting evidence of the results' robustness to variances between groups' size.

Post-hoc tests. Tukey HSD and Games-Howell tests (for dependent variables with homogenous and nonhomogeneous variances between groups, respectively) were conducted to identify the treatments that gave rise to the observed differences. These tests yielded three key findings that further substantiate the effectiveness of my manipulations:

1. The ***open*** network group significantly differed from the ***control*** group in terms of *MC3* (list of friends; + 2.17 mean difference, p<0.001), *MC4* (list of friends' friends; +1.02 mean difference, p<0.001), and *MC5* (social filtering; +1.6 mean difference, p<0.001). These results imply that subjects in the open network group experienced a stronger perception of social affordances than those in the non-SN group.
2. The ***private*** network group significantly differed from the ***control*** group in terms of *MC3* (list of friends; +1.75 mean difference, p<0.001), *MC5* (social filtering; +1.47 mean difference, p<0.001), *MC2* (content availability; -2.45 mean difference, p<0.001), but did not significantly differed from *MC4* (list of friends' friends; -0.01 mean difference, p=0.99), as expected. These results suggest that compared to subjects in the *non-SN*

condition, those in the *private* network group perceived (i) a stronger ability of the website to support the two key affordances of SN-enabled shopping settings (see list of friends, filter friends' content) than subjects in a non-SN setting, but also (ii) a stronger constraint in terms of accessing content beyond their circle of friends.

3. The ***private*** network group also significantly differed from the ***open*** network group in terms of *MC2* (content availability; -2.29 mean difference, $p<0.001$) and of *MC4* (list of friends' friends; -1.03 mean difference, $p<0.05$). These results indicate that subjects in the former group experienced stronger constraint in terms of accessing content and traversing the network (via list of friends' friends) than those in the latter..

3.6.3 Results of Comparing SN and non-SN Enabled Designs

The test of H1 and H2 enables answering whether *SN-enabled shopping settings are better able than non-SN ones to facilitate high quality product search experiences*, conceptualized as ones that are highly serendipitous (i.e., prone to unexpected findings) and diagnostic (i.e., informative). Table 3.7 provides descriptive statistics about the variables involved in the empirical models used to assess H1 (DV: Serendipity) and H2 (DV: Diagnosticity). In addition to the focal (design) independent variable, the model incorporates two control variables that could contribute to serendipity and diagnosticity in all conditions: the extent of user-generated content (UGC) and of product pages (PV) consulted by subjects during the task. The correlations between these variables are reported in Table 3.8 The highest correlation between the variables was between UGC and PV (Kendall's Tau=0.51), and all VIF scores were less than 2.5, which suggests that multicollinearity was not an issue (Neter et al. 1990). Appendix G reports the distribution of the variables involved in testing the research model.

Table 3.7 Descriptive Statistics: Mean (Standard Deviation) [H1, H2– Paper #2]

Variables \ Treatments Groups	Control N=28*	Private Network N=30*	Open Network N=27*
Serendipity**	4.23 (1.34)	4.72 (1.28)	4.78 (0.76)
Diagnosticity**	4.4 (1.13)	4.23 (1.35)	4.5 (1.13)
User-generated content (UGC)	20.68 (25.34)	7.02 (12.22)	13.37 (20.34)
Products views (PV)	6.44 (5.14)	6.93 (6.77)	6.46 (6.85)

* Isolates and/or outliers removed.

** The Diagnosticity and Serendipity constructs demonstrated adequate convergent validity (Cronbach's Alpha: 0.87 and 0.80, respectively), thus the average scores of their corresponding measurement items were used in the analysis.

Table 3.8 Variables Correlations* [H1, H2 – Paper #2]

	Serendipity	Diagnosticity	User-generated content (UGC)
Serendipity			
Diagnosticity	0.34		
User-generated content (UGC)	0.19	0.22	
Products views (PV)	0.17	0.07	0.51

* Kendall's Tau correlation coefficient was used to measure the association between the variables given the nature (count) of the UGC and PV variables.

3.6.3.1 Effects on Serendipity

H1 was tested via the following linear regression model:

$$\textbf{Serendipity} = \beta_0 + \beta_1 \textbf{D\_UGC} + \beta_2 (\textbf{D\_UGC*UGC}) + \beta_3 \textbf{PV} + \beta_4 \textbf{Design}.$$

The model includes the effect from the quantity of reviews read on the site during the task (UGC). Given that a significant proportion (30%) of subjects did not read any review during the product search task, the model also accounts for a threshold effect via a dummy variable (D_UGC) that takes the value zero for subjects that did not read any review (i.e., if UGC=0) and the value 1 for subjects that read at least one review (i.e., if UGC>0). Thus, β_1 captures the effect that occurs when the number of reviews read increases from zero to one, and β_2 represents the effect of a one unit increase in the number of reviews read (i.e., from x to x+1, if x>0). In addition, the model also controls for the number of unique product pages visited

by subjects (β_3). The number of products viewed variable (i.e., PV) did not exhibit the same distribution issue as the UGC variable (i.e., large number of zeros), hence no selection was included in the model. Finally, β_4 represents the platform's design effect (three categories: open SN-enabled private SN-enabled, not SN-enabled i.e., control) on serendipity.

The likelihood ratio chi-square (omnibus) test obtained from running the regression was significant (χ^2 =16.299, df=5, p=0.006). Further, the parameter estimates reported in Table 3.9 indicate that serendipity was significantly influenced by the number of reviews read by subjects (β_2=0.018, p=0.021), with each additional review read causing a 0.018 unit increase in serendipity. Serendipity was also found to be contingent upon the type of shopping platform design (β_4[private network vs. control]=0.73, p=0.09; β_4[open network vs. control]=0.68, p=0.011). The regression estimates indicate that subjects in the private (open) network group experienced, on average, 0.73 (0.68) more units of serendipity compared to those in the non-SN condition, a much stronger effect than UGC (approximately 40 additional reviews – 40*0.018=0.72 – are needed to match the design effects). Finally, there was no significant effect on serendipity from "the first review read" (β_1=0.124, p=0.634), neither from the number of products viewed (β_3=0.012, p=0.595). Overall, the model explained 12.2% of the variance in serendipity. Hence, these results bring support to H1.

Table 3.9 Parameter Estimates for the Linear Regression Analysis (DV: Serendipity)

			95% Wald Confidence Interval		Hypothesis Test		
Parameters	**B**	**Standard error**	**Lower**	**Upper**	**Wald chi-square**	**df**	**Sig**
Intercept	3.740	0.26	3.24	4.26	207.49	1	0.00
Private network (vs. non-SN)	0.73	0.28	0.085	1.176	6.827	1	**0.009**
Open network (vs. non-SN)	0.68	0.26	0.136	1.162	6.41	1	**0.011**
D_UGC=0 (vs. D_UGC=1)	0.124	0.256	-0.386	0.616	0.226	1	0.634
D_UGC =1*UGC (vs. D_UGC =0*UGC)	0.018	0.0074	0.000	0.029	5.347	1	**0.021**
PV	0.012	0.0216	-0.22	0.063	0.282	1	0.595

R-squared = 17.4%; Adjusted R-squared = 12.2%

Exploratory follow-up tests: subjects' product reach strategies. In order to further explore the theorized link between the shopping platform design and serendipity, I considered and analyzed the strategies used by subjects to reach restaurants. Given its design, the platform afforded five main strategies: (1) access to products via either the *cuisine or location* filtering mechanisms (ATT strategy), (2) access via *friends* (via friends' profile page or via the social feed) (FR), (3) access via the list of *alphabetically-ordered* restaurants (ALPH), (4) a *combination of ATT and FR where ATT dominates* (ATT-FR), (5) a *combination of ATT and FR where FR dominates* (FR-ATT). The strategies that involve FR were only afforded in the SN-enabled conditions (private and open network groups).

In order to operationalize product reach strategies, I triangulated (i) data from a script programmed into the platform to *count the number of unique product pages accessed via these means*, and (ii) *retrospective verbal transcripts* recorded at the end of the experimental task when subjects were asked to explain how they used the website to accomplish their task ("could you describe which appproach you used to decide which restaurants to add to your wishlist? For example, how did you search for and identify restaurants of interest?). Table

3.10 illustrates the method used to code the product reach strategies. Given the exploratory nature of this follow-up analysis, the coding was performed by a single researcher (this thesis' author) at this point.

Table 3.10 Illustrating the Coding Method Used (Product Reach Strategy)

Data From Platform Use	Data From Retrospective Verbal Transcripts	Coding
Seven restaurants were accessed via the location filter feed (4 restaurants) and the cuisine filter (3 restaurants).	"I filtered restaurants by neighborhoods I am familiar with and also by cuisines I like".	ATT
Four restaurants were accessed via the alphabetical list.	"I thought about restaurants that I wanted to try and then found them on the list and added on to my wish list".	ALPH
Five restaurants were accessed via the social feed (4) and via the alphabetically ordered list of all restaurants (1).	"I literally only looked at restaurants that my friends had reviewed. I'd find it useless to look at restaurants my friends did not review. When deciding which restaurants to view, I looked at the grid for those that had more than 1 friend who reviewed it - the number of reviews made a difference. The other filters (location, cuisine, all) were not useful because from what I could tell it showed all restaurants, not just the ones my friends reviewed".	FR
Twenty six restaurants were accessed via the cuisine filter (17), the social feed (6), and friends' profile pages (3)	"I gave a strong importance to restaurants that were reviewed by my friends, especially the ones that have similar taste than me or that I consider as gourmet. Location was not important. Cuisine was also important".	ATT-FR
Nineteen restaurants were accessed via the cuisine filter (6), location filter (1), and by friends' profile page (12)	"The match of my favorite cuisine-neighborhood that was recommended and positively reviewed by my facebook friends (the more the better)".	FR-ATT

I used this data in a cross-tab analysis which yielded a significant Chi-square test [$\chi^2_{(2,N=85)}$=0.55.791, p=0.00], suggesting variance in the product reach strategies being adopted by subjects in the three groups. In addition, Table 3.11 reveals two well-defined patterns:

- ***A predominance of FR (about 40%) or FR and ATT combined strategies (about 40%) in the two SN-enabled conditions***: subjects in these groups relied heavily on the SN features (social feed or friends' profile pages) to reach products.
- ***A predominance of ATT (53.6%) and ALPH (46.4%) strategies in the non-SN condition***: subjects in this group relied on product filters and on the alphabetical restaurnats list to reach products.

Table 3.11 Product Reach Strategies Between Groups

Strategies \ Groups		Private network	Open network	Non-SN	Total
ALPH	Count	1	1	13	15
	%	3.3%	3.7%	46.4%	17.6%
ATT	Count	4	6	***15***	25
	%	13.3%	22.2%	***53.6%***	29.4%
FR	Count	***13***	***11***	0	24
	%	***43.3%***	***40.7%***	0%	28.2%
FR-ATT	Count	6	1	0	7
	%	20%	3.7%	0%	8.2%
ATT-FR	Count	6	8	0	14
	%	20%	29.6%	0	16.5%
	Total	30	27	28	85

Legend for the strategies: ALPH: reaching products via an alphabetical list; ATT: … via an attributes-based filter; FR: …via friends' profile page or social feed of friends' list of product reviews; FR-ATT: … via both FR and ATT strategies, but largest proportion of products is reached via FR. ATT-FR: …via both FR and ATT strategies but the largest proportion of products is reached via ATT.
Note: The highest proportion in each condition is emphasized (bold and italic).

These results bring some supporting evidence to the role of divergent (friends-based) information seeking mechanisms as an explanation for the effect of SN designs into the generation of serendipity.

3.6.3.2 Effects on Diagnosticity

H2 was tested via a linear regression model using the same independent variables as for H1:

$$\textbf{Diagnosticity} = \beta_0 + \beta_1 \textbf{D\_UGC} + \beta_2(\textbf{D\_UGC*UGC}) + \beta_3 \textbf{PV} + \beta_4 \textbf{Design}.$$

The likelihood ratio chi-square (omnibus) test obtained from running the regression model was significant (χ^2 =13.36, df=5, p=0.02). The complete regression estimates (Table 3.12) indicated that UGC was the only significant driver of diagnosticity (β_2=0.026, p=0.001). Contrary to my expectations (H2), no significant effect from the platform design was observed on diagnosticity: neither the open nor the private network design yielded higher levels of diagnosticity compared to the non-SN design. The only variable that exhibited a significant effect was UGC, i.e., the amount of user-generated content obtained by consumers during their search task. Each additional review read was found to trigger a 0.026 average unit increase in diagnosticity. The regression model explained 9.1% of the variable in diagnosticity. Overall, although the results supported H1, as noted above, they failed to confirm H2.

Table 3.12 Parameter Estimates for the Linear Regression Analysis (DV: Diagnosticity)

			95% Wald Confidence Interval		**Hypothesis Test**		
Parameters	**B**	**Standard error**	**Lower**	**Upper**	**Wald chi-square**	**df**	**Sig**
Intercept	3.998	0.2684	3.469	4.521	221.633	1	0.00
Private network (vs non-SN)	0.155	0.2885	-0.41	0.721	0.29	1	0.59
Open network (vs non-SN)	0.253	0.2788	-0.293	0.80	0.827	1	0.363
D_UGC=0 (vs D_UGC=1)	0.142	0.2685	-0.385	0.668	0.278	1	0.598
D_UGC=1*UGC (vs. D_UGC=0*UGC)	0.026	0.0081	0.010	0.042	10.589	1	**0.001**
PV	-0.22	0.0228	-0.067	0.022	0.957	1	0.328

R-squared = 14.5%; Adjusted R-squared = 9.1%

Exploratory follow-up tests: product search 'efficiency'. In order to further explore the relationship between the shopping platform design and diagnosticity, I analyzed the *type* and *extent* of UGC acquired by subjects during their product search task. As Table 3.13 shows,

the platform enabled subjects in the private network to acquire friends' UGC only. Similar to those in the private network, subjects in the open network group benefited from a direct access to friends and their UGC, and could also access UGC from people that were not their friends. Subjects in the non-SN group could (by chance) run into reviews written by their friends (they had no social feed and list of friends). The figures reported in Table 3.12 are interesting because they indicate that for about the same level of diagnosticity obtained in the three group (means of 4.4, 4.23, and 4.5 in the control, private and open network groups, respectively), subjects in the non SN-enabled condition consumed a lot more UGC than those in the two other groups. In fact, an ANOVA and follow-up contrast tests identified a significant difference in the total UGC acquired between the private network and the non-SN groups [$F_{(2, 82)} = 3.486$, $p = 0.035$]. There was no such significant difference between the open network and the non-SN groups. Hence, these results suggest that while SN-enabled settings may not be yielding higher levels of diagnosticity overall, private networks seem to be more 'efficient' on that matter than the traditional, non-SN, shopping designs.

Table 3.13 Average Number of Reviews (UGC) Acquired by Shoppers

Groups / UGC	**Private Network** (N=30)	**Open Network** (N=27)	**Non-SN** (N=28)
From friends	7.2	5.0	0.43
From non friends	0 (by design)	8.34	20.25
Total	7.2	13.34	20.68

3.6.4 Results of Testing the Effects of SN Size

To test H3a and H4a (i.e., the strength of the SN size effect in the private vs. the open networks), I conducted independent-samples t-tests on serendipity (H3a) and diagnosticity (H4a) by using a dichotomous variable to separate subjects according to the size of their social network. The average SN size was 4.73 (N=30) in the private network group and 4.56

(N=27) in the open network group after removing isolates (i.e., SN size =0). Hence, this value was taken as threshold to distinguish subjects with low SN size (from 1 to 4) from those with high SN size (5 and higher).

In the private network group, there was a significant difference in the scores for *diagnosticity* between the low SN size (M=3.98, SD=1.27) and the high SN size (M=4.83, SD=0.66) groups; t(28)=-2.42, p =0.023. There was also a significant difference in the scores for *serendipity* between the low SN size (M=4.44, SD=1.11) and the high SN size (M=5.37, SD=0.94) groups; t(28)=-2.18, p =0.038.

In the open network group, there was no significant difference in the scores for *diagnosticity* between the low SN size (M=4.33, SD=0.97) and the high SN size (M=4.83, SD=1.23) groups; t(25)=-1.16, p =0.26. There was also no significant difference in the scores for *serendipity* between the low SN size (M=4.6, SD=0.97) and the high SN size (M=5.15, SD=1.23) groups; t(25)=-1.61, p =0.12.

These results (Table 3.14) indicate that SN size significantly influenced both diagnosticity (mean difference=0.85) and serendipity (mean difference=0.93) in the private network condition, but that it was not the case in the open network condition (mean differences of 0.50 and 0.55 for diagnosticity and serendipity, respectively). In this latter condition, while the differences observed were in the expected directions, they were too small to yield a significant effect. Thus, these results imply that the serendipity (H3a) diagnosticity (H4a) experienced by shoppers in SN-enabled shopping settings is more contingent upon their SN size in a private versus an open network condition, and thus ***support H3a and H4a***.

Table 3.14 Descriptive Statistics for H3a and H4a

		Sample Size	Mean	Std Dev.	Associated Hypotheses
Private network					
Serendipity	Low SN size	21	4.44	1.11	H3a
	High SN size	9	5.37	0.94	H3a
Diagnosticity	Low SN size	21	3.98	1.27	H4a
	High SN size	9	4.83	0.66	H4a
Open network					
Serendipity	Low SN size	18	4.6	0.87	H3a
	High SN size	9	5.15	0.78	H3a
Diagnosticity	Low SN size	18	4.33	0.97	H4a
	High SN size	9	4.83	1.23	H4a

To test H3b and H4b (i.e., effect of network design for subjects with ***low*** SN size), I conducted an independent-samples t-test, using low SN size subjects (i.e., those with SN size between 1 and 4), to compare serendipity (H3b) and diagnosticity (H4b) in the private and open network conditions. There was no significant difference in the scores for *diagnosticity* between the private network (M=3.98, SD=1.27) and the open network (M=4.33, SD=0.97) groups; t(37)=-0.98, p=0.34. There was also no significant difference in *serendipity* between the private network (M=4.44, SD=1.11) and the open network (M=4.59, SD=0.88) groups; t(37)=-0.46, p =0.65. Thus, these results fail to confirm the prediction that subjects with low SN size would experience less serendipity (H3b) and diagnosticity (H4b) when they are in a private network compared to an open network.

I applied the same procedure ***to test H3c and H4c*** (i.e., effect of network design for subjects with ***high*** SN size), but this time using a sample composed of subjects with high SN size. There was no difference in the scores for *diagnosticity* between the private network (M=4.83, SD=0.66) and the open network (M=4.83 SD=1.23). In addition, there was no significant difference in the scores for *serendipity* between the private network (M=5.37, SD=0.94) and

the open network (M=5.15 SD=0.78) groups; t(16)=0.55, p =0.59. These results (Table 3.15) confirm the prediction that subjects with high SN size would experience similar levels of serendipity (H3c) and diagnosticity (H4c) in the private and the open networks.

Table 3.15 Descriptive Statistics for H3b, H4b, H3c, and H4c

		Sample Size	Mean	Std Dev.	Associated Hypotheses
Low SN Size					
Serendipity	Private network	21	4.44	1.11	H3b
	Open network	18	4.59	0.88	H3b
Diagnosticity	Private network	21	3.98	1.27	H4b
	Open network	18	4.33	0.97	H4b
High SN Size					
Serendipity	Private network	9	5.37	0.94	H3c
	Open network	9	5.15	0.78	H3c
Diagnosticity	Private network	9	4.83	0.66	H4c
	Open network	9	4.83	1.23	H4c

Figure 3.4 and Figure 3.5 graph the results obtained from testing the aforementioned interaction hypotheses. Overall, H1, H3a, H4a, H3c, and H4c were supported, but there was no support for H2, H3b, H4b. The implications of these results are considered next.

Figure 3.4 Serendipity Values Contingent on Design and SN Size

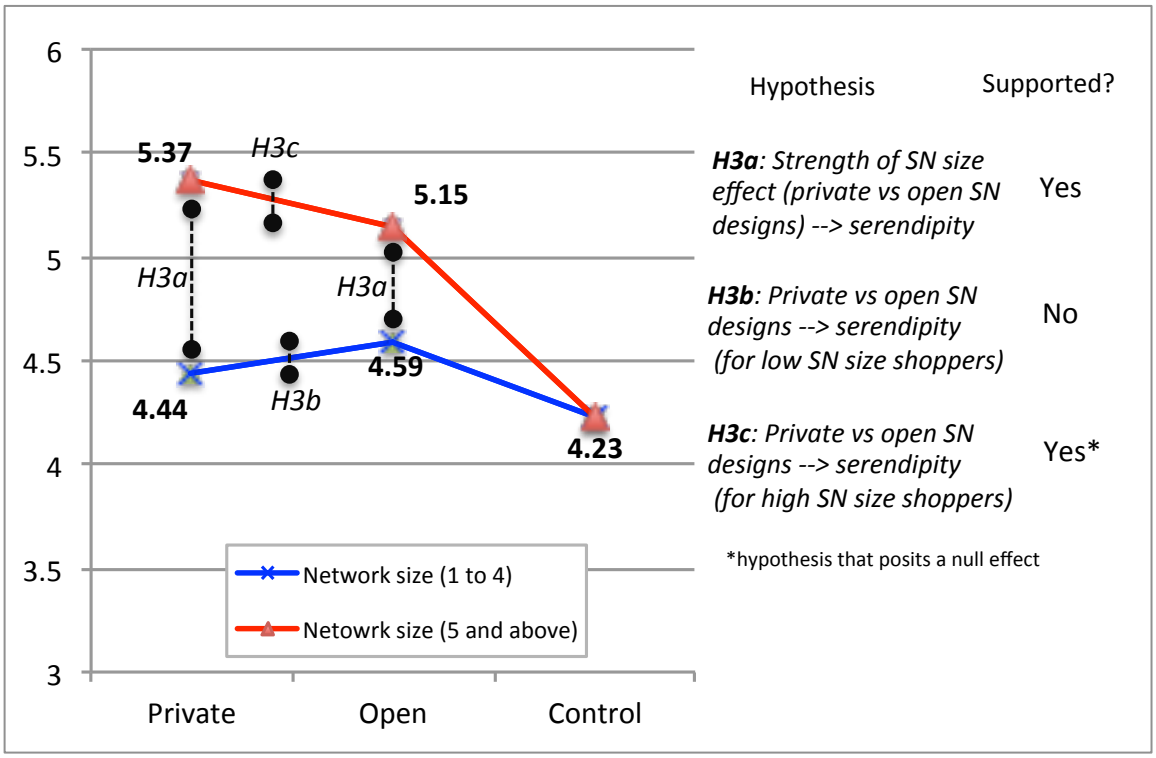
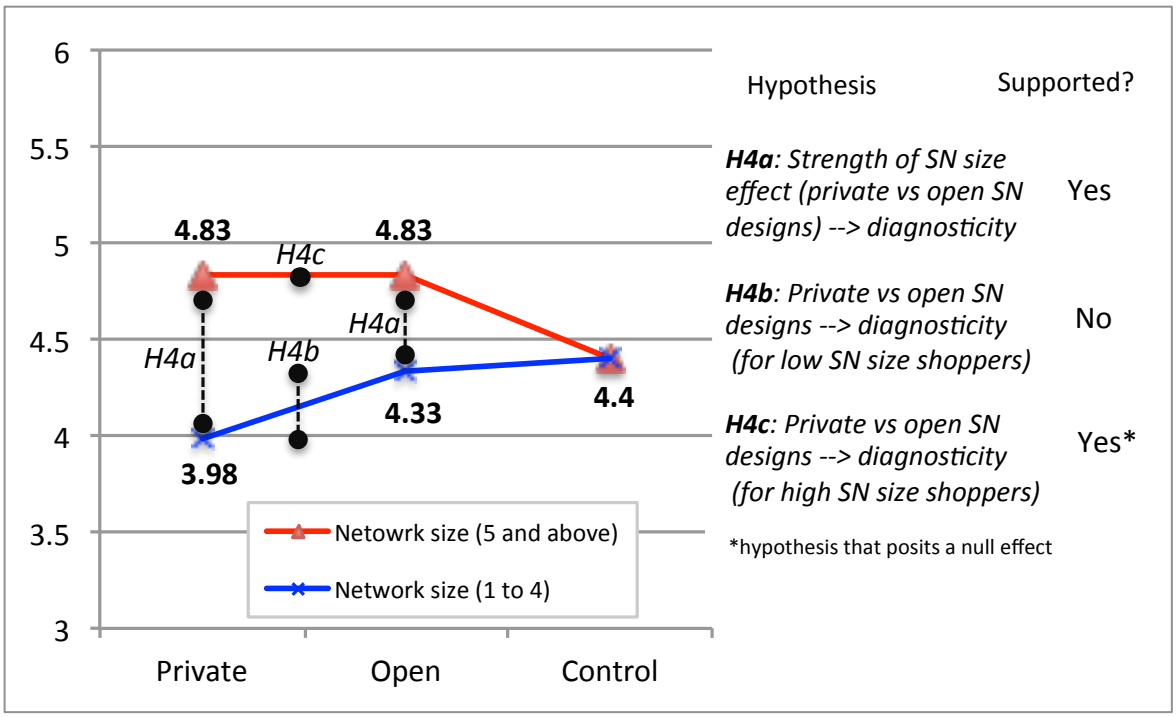


Figure 3.5 Diagnosticity Values Contingent on Design and SN Size



3.7 Discussion

The importance of investigating the design and social properties of digital networks has been emphasized in recent IS research (Agarwal et al. 2008; Sundararajan et al. 2013), together with the need to provide evidence about the value of social commerce initiatives *compared to* non-social ones (Hennig-Thurau et al. 2013; Yadav et al. 2013). This study contributes to answer these calls by being one of the first to experimentally examine the influence of SN-enabled shopping platforms on consumers' experiences, and to do so in the context of two different types of network designs as well as by taking into account the size of shoppers' social network.

The most salient benefit of SN-enabled shopping platforms that this study observed is their positive influence on shoppers' perceived level of serendipity. Faithful to the proposed theoretical explanation for this effect, follow-up exploratory analyses revealed that subjects that were either in the private or the open network design condition had a strong tendency to engage in social navigation. Social navigation is an information-seeking mechanism that reflects a much more divergent and less systematic information seeking strategy than traditional means (i.e., product attributes based navigation). In SN-enabled shopping environments, social navigation is supported and induced by the presence of features such as the display of one's list of friends, the presence of interactions with products in friends' profile page, the access to a social feed of friends' interactions with products. Thus, this study provides supporting evidence for the role of social navigation as a plausible mechanism for explaining the effects of SN-enabled designs on shoppers' assessment of the platform's ability to yield unexpected yet useful findings.

To my surprise, the results indicated no substantial difference in diagnosticity between the SN-enabled and the non SN-enabled design conditions. In interpreting this finding, one needs to consider that the way I manipulated the platform design was relatively conservative in two respects. First, all subjects, irrespective of the experimental conditions, could see the profile page of other shoppers, including a first name and picture. This may have contributed to augment diagnosticity because prior research found that reviews that include identity-descriptive information were perceived as more trustworthy (Kusumasondjaja et al. 2012) and more helpful (Forman et al. 2008). Second, given that all subjects had to log in to the website using the Facebook connect tool, they may have attributed more credibility to other users' reviews than if these users' identity had not been verified. This in turn relates to diagnosticity because source credibility tends to augment the value of the message being communicated (Pornpitakpan 2004). Hence, it is possible that the UGC available in the study's non SN-enabled condition was better able to assist shoppers in evaluating products compared to settings in which UGC is anonymous.

This study also offers insights into the performance of two types of SN-enabled platform designs, those designed with narrow boundaries (i.e., private networks) and those designed with unconstrained boundaries (i.e., open networks). Private networks have the advantage of providing intimate environments, where users have the authority to selectively release private information to some but not all (Gross and Acquisti 2005). The empirical results indicated another potential benefit of private networks in that while they did not yield significantly more diagnosticity than a non-SN design, they seemed to be more efficient in that respect (as less UGC was needed to reach similar levels of diagnosticity). However, the results confirmed the hypothesis that private networks have the important weakness of inducing

more inequality: the level of diagnosticity and serendipity reported by subject using this design was contingent upon shoppers' level of connectedness while such a significant effect was not observed in the case of open networks. In open networks, consumers who have few friends may in fact be able to compensate by consulting UGC from other consumers outside their personal network. In the real world, while social shopping platforms may provide users with the option of selectively providing information (i.e., disclosing their UGC to friends only), this leeway is relatively uncommon, and the level of network openness remains mostly a platform's choice. Thus, it is important that platform owners are aware of the contingent effects of such design decision on consumer experience. In that matter, I recommend that they observe how their users' social network size is distributed. If most users have small personal networks, a private network design is likely to be more detrimental to consumers, both in terms of diagnosticity and serendipity, than an open network design.

When assessing the contributions of this study, it is important to recognize its limitations. In terms of statistical conclusion validity, my sample size was adequate for discerning medium sample sizes for H1 and H2, but larger sample would have afforded more powerful tests that might have detected a significant effect on diagnosticity (H2). I believe that this limitation is minor given that the observed effects of SN designs on diagnosticity did not appear very meaningful (about 0.50 point difference), especially compared to the effect on serendipity (about 1 point difference). The issue of sample size seems more noteworthy and need to be taken with caution for H3c and H4c (comparing network designs with high SN size subjects) as null effects were tested with samples of 18. They also relate to aspects of external validity. The average SN size of subjects that took part in the online experiment was 4 and ranged from 1 to 15, therefore the results are bounded to cases of SN-enabled shopping platforms in

which shoppers have networks of this size. That is, it is possible that the effects posited in H3c and H4c do not hold for SN sizes higher than that, although I would expect a plateau effect to manifest.

This research could be extended in several ways. The study focused on a single property of shoppers' SN structure (i.e., SN size), and I believe that additional aspects could be relevant. For example, it would be interesting to examine the influence of other qualitative (i.e., SN quality) and quantitative variables (i.e., SN density) in light of the additional navigational and informational cues these might trigger on consumers' product search experience. Researchers could also extend this work by examining alternatives to an open or a private network design, such as a semi-private/open design in which shoppers would be bounded to traversing and accessing the content up to the friends of their friends. A semi-private/open network may afford 'the best of the two worlds', providing relatively intimate spaces prone to relevance and efficiency while in the meantime enabling some leeway for shoppers to benefit from the additional resources of their friends' friends. This will be an interesting domain of future empirical investigation.

3.8 Conclusion

The study of network design is new to traditional (i.e., offline) organizational social network research as it involves questions of design science, which Information Systems (IS) scholars are best positioned to address (Kane et al. 2014). In this research, I empirically examined the effects that SN-enabled shopping environments have on the levels of diagnosticity and serendipity experienced by shoppers during product search. The results established serendipity as a prominent advantage of SN-enabled shopping settings, and revealed such settings enable as much (and not more) of diagnosticity albeit with less content. The

strongest evidence in that regard was observed for private networks. Importantly, such private network designs should not, however, be considered as the unconditional optimal design solution as their effect on both serendipity and diagnosticity appeared to be strongly contingent on shoppers' level of connectedness. To my knowledge, no prior e-Commerce research has empirically assessed the value of such settings using objective social network data and an experimental setup. Thus, I hope that the insights provided by this study can be used as baseline to further our understanding of the pros and cons of integrating social networks and online shopping environments.

Chapter 4: Do All Roads Lead to Rome? A Multi-Mediation Model for Explaining Customers' Utilitarian and Hedonic Outcomes in the Context of Product Search within Social Network-Enabled Shopping Websites (Paper #3)

4.1 Synopsis

While online social networks and e-Commerce environments used to be mostly independent, they have recently begun to converge into hybrid configurations via which online users search for products in the context of their social relationships. This constitutes one of the most powerful shifts in e-Commerce during the last decade. Although research on this topic is in the early stages, there seems to be sufficient theory and evidence to conclude that socially embedded shoppers benefit from different levels of social capital based on who's immediately available to them (i.e., their centrality in the network) and how relevant they are (i.e., the quality of their network), and to expect that this capital creates value. However, we know very little about *how* centrality and quality have their effects (if any). Providing insights into this process is important because it will help develop a clearer understanding of the mechanisms via which digital networks influence customers' product search experiences. The present study theorizes about the role of three intervening mechanisms (social network activation, effort reduction, and curiosity arousal) in explaining how shoppers' differences in social capital influence the extent to which product search experiences are perceived to be useful and enjoyable. The choice of these mechanisms was based on a review and integration of theories of social capital (i.e., how networks generate value) and online consumer

behavior (i.e., how online users respond and exploit the signals offered in online settings), and their application to the SN-enabled shopping context. An online experiment was conducted using a custom-developed website with restaurants as products and shoppers' Facebook social ties as the underlying SN. The results showed that *several roads, but not all, lead to Rome*, and that *some roads remain inaccessible*, which creates interesting future research avenues discussed at the end of the paper.

4.2 Introduction

It has now been twenty years since Amazon, the leading online vendor, first opened its virtual doors. Since then, e-Commerce revenues haven't stopped growing, so much so that the US, Western Europe, and China are expected to generate $800 billion in online sales this year (Widger et al. 2014). There is little doubt that the increasingly sophisticated design of E-Commerce platforms have contributed to this success by offering innovative transactional (e.g., express check out), relational (e.g., blogs), and more recently, social (e.g., connect to friends from Facebook) functionalities, presumably making online shopping more fun and effective (Gonçalves Curty and Zhang 2013).

An e-Commerce website becomes fundamentally social when its supporting technological platform enables consumers to *share content about products* (e.g., create product reviews, lists, style boards) (Olbrich and Holsing 2011), <u>and</u> to develop an online *profile*, *connect* to peers, and *traverse* and *exploit* the created social network (SN) as a means to navigate the informational space (Kane et al. 2014). The SN-enabled shopping environments formed as a result emphasize relations between shoppers (i.e., shoppers' social ties), and interactions between shoppers and products, i.e., shoppers' user-generated content (UGC) ties (Hennig-Thurau et al. 2013). They are expected to become prevalent in the near future as online users

get accustomed to how SN sites function (Sareen 2014) and major e-Commerce players continue investing in social commerce. For example, Amazon recently acquired Goodreads, a social platform used by 16 million users to connect, exchange about, and purchase books[19], and Netflix integrated its video catalogue with Facebook, thereby enabling users to know what their friends viewed and recommended[20]. Yet, despite strategic moves from a few online retailers, the average adoption rate of online social commerce models remains modest, at around 6% of the top 500 (Social Labs 2012). This low figure is not that surprising given the relative novelty of the enabling technologies, but also given our limited understanding of their influence on consumers, a knowledge gap which constitutes a prominent barrier to the effective and sustainable growth of online social commerce (Yadav et al. 2013).

One way to start addressing this gap is to investigate online shoppers' behaviors and perceptions with respect to product search within SN-enabled environments. The relevant literature on the topic reveals two independent themes that would benefit from being integrated. On the one hand, social capital theories explain that people who do better are somehow better connected (Borgatti and Cross 2003; Burt 1992; Coleman 1988; Granovetter 1995; Lin 2001; Umberson et al. 1996). On the other hand, prior work on how website design can enrich the interactive experiences of online shoppers suggests that social cues and functionalities induce hedonic and utilitarian value (Hassanein and Head 2007; Kumar and Benbasat 2002; Qiu and Benbasat 2005, 2009; Wakefield et al. 2011; Wang et al. 2007). Thus, substantial literature exists on each separate effect, but not on how they work together. The goal in this study is to address this research gap by explaining *how* online social

[19] http://techcrunch.com/2013/03/28/amazon-acquires-social-reading-site-goodreads
[20] http://news.cnet.com/8301-1023_3-57574027-93/netflix-facebook-hook-up-in-u.s-at-last/

relationships facilitate useful and enjoyable product search experiences in a SN-enabled shopping environment.

To meet this research goal, I theoretically articulate the functioning and role of three value-creation mechanisms. The first mechanism, identified as *social network activation*, refers to shoppers' mobilization of the product related content their friends generated. The second, *effort reduction*, is shoppers' reduced search effort, and the third, *curiosity arousal*, is the stimulation of shoppers' interest. The choice of these mechanisms was based on integrating theoretical foundations from the social capital and online consumer behavior research streams, and applying them to the SN-enabled shopping context.

In the remainder of this paper, I first elaborate on the theoretical foundations of the study and derive the hypotheses to be tested. The empirical setting (an online experiment conducted in the context of a custom-developed restaurant review site integrated with the Facebook SN platform) and data collection procedures are then described, followed by a presentation of the findings. The study contributions are finally discussed in light of its limitations.

4.3 Theoretical Foundations

4.3.1 The Value of Social Networks

The study of social network outcomes is rooted in the concept of social capital, defined as the potential value embedded within social relationships. Social capital theories rely on the observation that people who do better are often more or better connected. They postulate that the social relationships possessed by individuals (or any social unit) constitute a valuable asset because they can facilitate flows of information, enable social influence, signal social credentials, or reinforce one's identity (Lin 2001). Social capital has been a prolific concept used to explain outcomes of several different natures (Ahuja et al. 2003; Granovetter 1995;

Umberson et al. 1996) at various levels of analysis (Nahapiet and Ghoshal 1998; Putnam 1995; Wasko and Faraj 2005). Researchers agree that social capital is better understood via multiple dimensions that capture both quantitative and qualitative properties of SNs. For example, Flap and Volker (2004) identified three key constituting elements of social capital: the number of persons within one SN, the readiness of these people to help, and the resources of these persons. In turn, Tsai and Ghoshal (1998) suggest that social capital depends on structural aspects of SNs, such as the presence/absence of ties (e.g., who you know), in addition to relational (e.g., trustworthiness) and cognitive (e.g., shared language) assets that facilitate the exploitation of social ties. Accordingly, Adler and Kwon (1998) summarized that social capital is found in both the structure and the content of social relations.

While the "hard core" of organizational network thinking focuses on network properties and configurations as the primary causal agents responsible for outcomes of interest (Kilduff et al. 2006), the concomitant role of human agency has also been acknowledged (Coleman 1988; Lin 2001). For example, recent work demonstrated the utility of assessing variations in how individuals *activate* the potential that is afforded by their network for achieving their goals (Gulati et al. 2014; Smith et al. 2012). In other words, it appears that "occupying a certain position within a SN carries certain potentialities, but the actual outcomes may depend on a number of additional factors, including how the actor plays it" (Borgatti and Halgin 2011 p. 11). The role of human actions is further highlighted in Lin's definition of social capital in terms of the resources (e.g., money, information, power) that are accessed and/or mobilized in purposive actions via an individual's social connections (Lin, 2001). Some studies in IS have explained the role of SNs in influencing system acceptance (Sykes et al. 2009), system success (Sasidharan et al. 2011), or user satisfaction in the context of IT

service delivery (Sun et al. 2012), by accounting for network properties (e.g., density) but also actors' activation of social ties (e.g., using others to get help on how to use a system).

While the aforementioned concepts, developed in the context of offline SNs, remain applicable to contexts in which SNs are embedded within information technology (IT) platforms, two assumptions need to be highlighted. First, studies of offline SNs tend to rely on the idea that individuals depend on social ties' readiness to help in order to obtain resources (e.g., "I have to request for advice and wait for my friend to answer") (Borgatti and Cross 2003; Flap and Volker 2004). On the contrary, digital SNs are structured around online profiles and relationships that users can typically freely traverse (Kane et al. 2014), eschewing the need of others' intervention (e.g., reply to a request). Second, studies of offline networks tend to assume that individuals selectively release resources to their social ties (e.g., with friends only) (Burt 2005). Conversely, digital SNs can be designed such that resources created by network actors are by default accessible to all who care to look (Gray et al. 2011). As a result of these two differences, *selective information seeking* in SN-enabled online settings (i.e., deciding from whom and how much information to acquire) is likely to be a prominent explanation of user outcomes.

4.3.2 Information Seeking and Processing in Online Environments

A website can be conceptualized as a stimuli-based decision-making environment (Tam and Ho 2005) in which signals (or cues) infuence shoppers' attention as well as decisions about which informational content to rely on and which paths to take. As explained next, several theoretical accounts of individuals' information seeking and decision-making behaviors suggest that shoppers tend to be sensitive to online environmental cues, especially when these cues appear to be relevant, easy to process, and engaging.

4.3.2.1 Online Users' Sensitivity to Environmental Signals

Individuals, including those shopping online, tend to adapt their decision-making behaviors to the environments in which they situate (Bettman et al. 1998; Payne et al. 1993). Several theories have been developed and used to explain those adaptive behaviors. The Elaboration Likelihood Model (Petty and Cacioppo 1986) and the Heuristic Systematic Model (Chaiken 1980) propose that information processing occurs either via an effort intensive, central route, or a heuristic-based, peripheral route. This contingent approach to decision-making is in line with the effort-accuracy framework, which views consumers' decision-making process as a tradeoff between the accuracy of a decision and the effort (e.g., accessing and interpreting information-bearing item) required to make the decision (Kleinmuntz and Schkade 1993; Payne et al. 1993). Indeed, online users are known to be sensitive to elements of computer-mediated information spaces that facilitate the use of heuristics, i.e. cognitive shortcuts that diminish information processing effort (Todd 2007). Further, according to signaling theory (Kirmani and Rao 2000), consumers tend to make inferences based on aspects of a store environment such as ambient (e.g., music), design (e.g. layout) and social (e.g., friendliness of staff) factors as they look for information processing shortcuts (Baker et al. 1994). For example in online settings, website quality (i.e., a design factor) was found to act as an effective signal of product quality (Wells et al. 2011). In the same vein, information foraging theory explains that online users adjust their behavior to informational settings, such that browsing and searching activities are directed by their subjective assessment of the informational "scent" of the cues they notice (e.g., their perceptions of the expected value and cost of choosing one path versus another) (Chi et al. 2001; Pirolli and Card 1999). In parallel to being sensitive to informational cues that are relevant and have the potential to

support accurate inferences at a low cost, information seekers are also known to be responsive to signals that pique their curiosity (Koo and Ju 2010; Pisula 2009; Rounds 2004), that is, signals that arouse their sensory and/or cognitive interest. Sensory curiosity is stimulated when attention emerges via stimuli such as a change in light or sound. Cognitive curiosity is an arousal triggered by informational aspects such as the novelty, complexity, and surprise associated with the content (Berlyne 1960), or the awareness of an unpleasant information gap that further exploration could resolve (Berlyne 1954; Loewenstein 1994).

4.3.2.2 Social Signals in SN-Enabled Shopping Environments

SN-enabled shopping environments belong to the family of social media networks (SMNs). SMNs have four defining characteristics: their users can create a unique profile, articulate a list of other users with whom they share a social relation, traverse these connections and those made by others on the platform, and access digital content via mechanisms offered by the platform (Kane et al. 2014). Applied to a context in which the focal underlying network structures are those among shoppers but also those between shoppers and products, the taxonomy of SMN features helps specify four unique characteristics and associated social signals of online SN-enabled shopping settings. First, shoppers are formally *identified* (i.e., they have an online profile) and are connected to others via a link that signals some sort of *social role*, typically referred to 'online friends' (Jacks and Salam 2009; Lin et al. 2013). Friendship tends to have a more fluid meaning in online than in offline settings, but in general, online friends refer to a subset of a website's user base that includes peers who are closer, more familiar, or more relevant than the other users. Second, SN-enabled shopping environments offer shoppers an additional entry point to the information space via the provision of a direct *access* to their local network, i.e., online friends and their resources,

thereby providing a socially personalized context to online shoppers. For example, users' list of friends and the feed of friends' activities such that those related to products (Ellison and boyd 2013) signal the possibility to access content based on shoppers' social connections and shoppers links to products. Third, shoppers benefit from additional means to *navigate* the information space, as the digital SN structure is made visible and traversable. Thus, a shopper can hop from one network member's profile page to another user's page, typically via the list of friends disclosed on each shopper's profile page. Fourth, SN-enabled environments tend to formalize (i.e., create signifiers about) users' associations with products (e.g., 'like', 'want', 'purchased' 'bookmarked', 'reviewed', 'recommends'), and to make them visible. Such associations are referred as *UGC ties*, and represent friends' opinions on or activities related to products. Social feeds illustrate the type of features that signal the presence of UGC ties. Table 4.1 summarizes the nature and affordances of the prototypical signals available to online shoppers in SN-enabled shopping environments.

Table 4.1 Social Signals Specific to SN-Enabled Shopping Settings

	Social Signals			
	Identity and Role	**Local Accessibility**	**Navigability**	**UGC Ties**
Description	Shoppers have an online profile and relate to others on the basis of a social role (e.g., friend).	Shoppers' location in the SN represents an additional entry point to the information space.	The SN is represented by a digital information structure that can be traversed.	The relations between shoppers and products are formalized and made visible.
Affordances	A shopper can recognize who are her friends among all other shoppers.	A shopper can identify and access resources from others to whom she is connected.	A shopper can navigate from a shopper's profile page to another shoppers' page.	A shopper can appreciate how shoppers and products are related.
Illustrative features	Profile page Friendship ties	My list of friends Social feed	List of friends in a user profile page	Review, like* Social feed
Related SMN features	Digital profile Relational ties	Relational ties Search and privacy	Network transparency	Network transparency

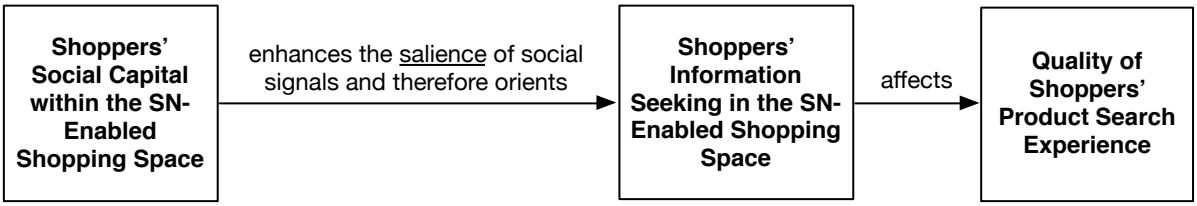
Keys: SMN: Social Media Networks (Kane et al. 2014)
* Identifiers of shoppers' links to products within a product page, a shopper profile page, or a social feed.

4.3.3 Social Capital and Social Signals: How They Work Together

The cues embedded within the design of interactive environments (e.g., menu labels, images, third-party seals, consumer testimonials) may be useful for a variety of purposes. As explained above, the features and associated signals that are distinctive of SN-enabled shopping settings afford the following: (i) the identification of shoppers and how they relate to each other, (ii) the direct accessibility to one's local social circle and its resources, (iii) the navigability of SN structures, and (iv), the cognizance of users' attitude towards products. The *salience* of these social signals relies on shoppers' social capital because information spaces convey meaning via both a basic architecture and content that feeds it, and the content available to shoppers in SN-enabled shopping settings depends on their social ties (e.g., how many friends they have, which information they have shared). In extreme cases, the salience of those signals to a shopper with no friends will be nil. Therefore, in a SN-enabled shopping environment, users' social capital is expected to influence information seeking by making the four social signals more or less noticeable and information-bearing.

Figure 4.1 illustrates the framework resulting from integrating the two streams of research on the value of social networks (i.e., social capital theories) and the consideration of websites as stimuli-based decision-making environments, and from applying it to a SN-enabled shopping context. The framework relies on three core ideas developed when reviewing and integrating the relevant literature: (i) social capital is generative of value, (ii) information seeking is an important factor explaining the quality of shoppers' product search experiences in environments where they are socially embedded, and (iii) SN-enabled shopping settings convey social signals whose salience relies on each shopper's social capital.

Figure 4.1 Integrative Research Framework

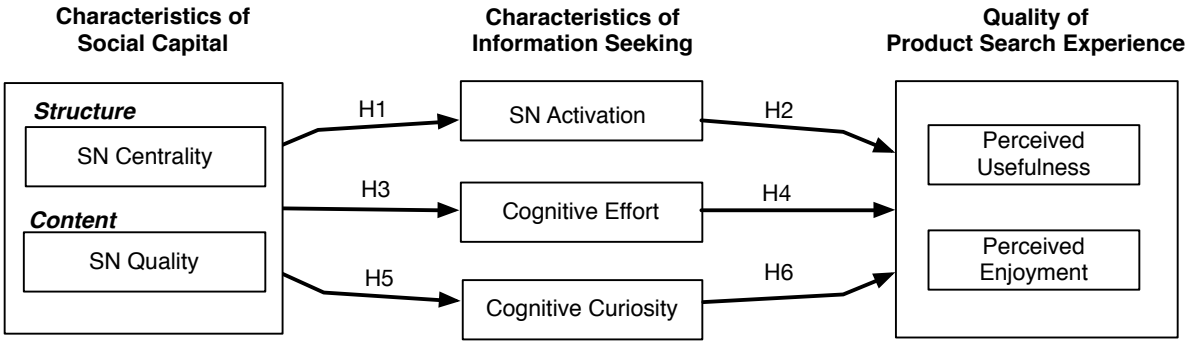


In the coming section, I use this framework as a basis to develop a research model that further explains how online shoppers capitalize on the SN into which they are embedded on a shopping site to gain utilitarian and hedonic value from their product search activities.

4.4 Research Model and Hypotheses

The proposed research model is illustrated in Figure 4.2.

Figure 4.2 Research Model



Shoppers' assessment of the quality of their product search experience are conceived in terms of *perceived usefulness* (PU) and *perceived enjoyment* (PE), two constructs commonly studied in e-Commerce (e.g., Xu et al. 2013) and IS research in general (e.g., Van der Heijden 2004). PU conveys the idea of the degree of performance of a user carrying out a task with a system. Applied to the study context, PU is defined as the extent to which consumers believe that using a SN-enabled shopping site is useful for supporting the

identification of products of interest. Individuals' affective response is another important indicator of the quality of online experiences (Hoffman and Novak 2009). Thus, I incorporated a hedonic dimension (PE), defined as the extent to which using a SN-enabled shopping site for product search is perceived to be enjoyable.

In line with prior research that identified both a structure and content aspect to the notion of social capital, the research model distinguishes between the dimensions of: (i) *SN centrality,* which is the extent of social capital immediately available to an online shopper (Cross et al. 2004; Wasserman and Faust 1994), and (ii) *SN quality*, which refers to the relevance of a consumer' social ties in the context of her shopping task. As explained earlier, social capital (both the centrality and quality aspects of it) enhances the salience of the social cues inherent to SN-enabled shopping settings, thereby influencing information seeking, i.e., how online shoppers use the SN-enabled shopping platform to search for products.

Information seeking is in turn conceptualized via three variables that are also derived from the literature review. *SN activation* refers to the magnitude to which shoppers leverage their friends' informational content during product search. It is a manifestation of 'network activation' whereby network actors leverage their social relations to acquire resources (Gulati et al. 2014; Lin 2001). C*ognitive effort* refers to the extent of effort incurred by shoppers during product search. Substantial theory and evidence suggests that online users are sensitive to cognitive shortcuts that help diminish information processing effort (Chaiken 1980; Gigerenzer and Gaissmaier 2011; Kleinmuntz and Schkade 1993; Pachur et al. 2011), and SN-enabled settings seem well-positioned to support effort-reducing strategies given the rich social cues they offer (e.g., using the products recommended by my friends as a consideration set). *Cognitive curiosity* is the extent to which shoppers get cognitively aroused

during product search. This dimension was included based on previous work that highlighted information seekers' responsiveness to signals that engage their curiosity (Koo and Ju 2010; Pisula 2009; Rounds 2004), and the expectation that the social cues embedded SN-enabled shopping settings could induce such stimulation.

4.4.1 Value Creation Process #1: Social Network Activation (H1, H2)

The relationship between social capital and SN activation. SN-enabled shopping platforms emphasize the presence of cues that indicate an easy path toward reaching friends and the informational resources they contributed. In that regard, 'identity and role', which affords recognizing who are my friends among all other shoppers, and 'local accessibility', which affords accessing resources from others to whom I am connected (as per Table 4.1), can be considered as high "scent" cues, i.e., proximal signals that trigger information seeking towards a path that is expected to lead to a more distal but highly relevant information item (Pirolli and Card 1999). The influence of environmental cues is typically higher for informational items that are (i) more accessible and locally relevant (Choo 1998), (ii) self-referent (i.e., content that is personalized to a shopper and/or his past experiences) (Tam and Ho 2006), and (iii) created by relevant (e.g., familiar, similar, powerful) others around us (Wilson and Sherrell 1993). Hence, in SN-enabled contexts, the more salient these social signals (i.e., the more relevant and numerous friends around), the stronger their influence on shoppers' information seeking activities towards the acquisition of informational resources that friends have produced.

Hypothesis 1. SN centrality (H1a) and SN quality (H1b) increase SN activation.

The effects of SN activation on PU and PE. Useful e-Commerce experiences require that consumers have the right information to make choices, and therefore, are helped in that

respect by website designs that encourage product understanding (Jiang and Benbasat 2007) and assist consumers in feeling informed (Smith et al. 2011). SN activation refers to the acquisition of informational resources created by friends in a social shopping network. While the notion of 'friends' in social media networks may be more inclusive than it is in real life, it is generally acknowledged that people in one's personal network are more *similar* and/or more *familiar* and/or *credible* than those that are outside of it (Yadav et al. 2013). Prior research provided evidence that the three aforementioned properties of those within one's social circle (i.e., similarity, familiarity, and credibility) induce usefulness. Online shopping environments that appear more familiar and personalized to consumers yield higher levels of trustworthiness by decreasing uncertainty and providing better answers to one's informational needs (Komiak and Benbasat 2006). Recommendations from similar others also tend to be associated with higher levels of trust (Ziegler and Golbeck 2007), and trust is an established predictor of PU (Gefen et al. 2003). The source credibility of a message was also identified as an important driver of usefulness (Sussman and Siegal 2003). Hence, SN activation is expected to influence PU because consumers value information they can trust and that makes information processing more effective in light of their preferences and/or expectations. Next, friends' report of their experiences with products is expected to be entertaining because online social content is fun and compelling (Shneiderman 2004). An additional possible explanation for the relationship between SN activation an PE is trust, which has been considered as an antecedent to online shoppers' satisfaction (Kim et al. 2009), an affective response to a website. Hence, I propose the following hypothesis:

Hypothesis 2. SN activation increases consumers' perceived levels of usefulness (H2a) and enjoyment (H2b).

4.4.2 Value Creation Process #2: Effort Reduction (H3, H4)

The relationship between social capital on cognitive effort. Individuals are known to be 'socially rational' in their decision-making in that they tend to construct choices on the basis of information available from other people within their environment (Gigerenzer 1996). 'Local accessibility' and 'UGC ties' (as per Table 4.1) are two prominent cues induced by the organization and display of information in SN-enabled shopping settings that are expected to be most instrumental in the context of the effort reduction mechanism. Indeed, signal opportunities for shoppers to reduce the level of effort needed to select products via supporting decision-making strategies that leverage information processing shortcuts based on one's social circle, i.e., that involve some degree of social rationality (Hertwig and Herzog 2009). Social rationality may manifest in SN-enabled shopping settings via two effort-reducing paths: first, via social learning, which relis on copying the behaviors of those that one recognizes (e.g., accessing one's friends profile page to see the products they relate to) (Goldstein and Gigerenzer 2002), and second, via the use of social filters that enable reducing the number of products within one's consideration set to those that friends have interacted with (e.g., taking the products included in a social feed as those to consider) (Todd 2007). The informational space in SN-enabled shopping can therefore be expected to provide suitable means to assist users in making fast and frugal information searches especially when peers around them are highly salient (i.e., numerous and relevant).

Hypothesis 3. SN centrality (H3a) and SN quality (H3b) decrease cognitive effort.

The effects of cognitive effort on PU and PE. I expect that the level of effort expanded by consumers during product search will have a negative effect on their perceptions of usefulness and enjoyment. Prior research suggests that users' seamless interactions with

systems should improve their focus and task performance (Eysenck 1982). In addition, the Technology Acceptance Model explains that when two systems provide equally relevant information for the conduct of a focal task, but one is more costly to operate than the other, the system requiring less effort should be the one deemed overall more useful for the purpose of the focal task (Davis et al. 1989). Next, the link between cognitive effort and PE is supported by theories of intrinsic motivation, which explain that the easier a system is to interact with the greater the sense of self-efficacy experienced by a user (Bandura 1982), and therefore the greater the user's sense of self-determination (Deci 1975) and positive affect (Compeau et al. 1999). Overall, prior IT adoption research has offered substantial evidence that systems that are difficult to use are less likely to useful and enjoyable. For example, a study conducted in the context of a movie website reported positive relationships between ease of use (an opposite of cognitive effort) and PU and PE (path coefficients of 0.48 and 0.59, respectively) (Van der Heijden 2004). Therefore, I propose the following hypothesis:

Hypothesis 4. Cognitive effort decreases consumers' perceived levels of usefulness (H4a) and enjoyment (H4b).

4.4.3 Value Creation Process #3: Curiosity Arousal (H5, H6)

The relationship between social capital and cognitive curiosity. Both 'identity and role', and 'navigability' cues (as per Table 4.1) are expected to be involved in the manifestation of social curiosity by affording a relevant social context with stimulating options for exploration (Steenkamp and Baumgartner 1992). First, the literature on online behaviors provides evidence that 'identify and role' signals induce engaging experiences. Socialness, which is the extent to which consumers detect social presence (e.g., via social roles), was shown to lead to arousal and flow (Wang et al. 2007). Social awareness was also found to be a strong

contributor of cognitive absorption in virtual worlds (Goel et al. 2011). This stream of research is in line with the notion that individuals have an evolutionary bias toward social orientation that leads them to be more curious about other people, especially the ones they know (Reeves and Nass 1996). In that respect, curiosity is likely to result from the awareness of an informational gap about friends' relations to products (Loewenstein 1994). Second, 'navigability' signals offer supplementary options for exploration, which has the potential to generate curiosity (Malone 1980). Faithful to the explanation offered earlier about how social capital and social signals work together, the salience of the aforementioned signals is expected to be stronger when shoppers' centrality in the SN and the quality of his/her social relationships are higher. Thus, I propose the following hypothesis:

Hypothesis 5. SN centrality (H5a) and SN quality (H5b) increase cognitive curiosity.

The effects of cognitive curiosity on PU and PE. The positive effect that I anticipate between social curiosity and PU is related to the informational gap, discussed above, which is induced by the presence of socially relevant others. This gap prompts a feeling of arousal, which is a driver of information seeking behaviors targeted towards the goal of closing the gap (Loewenstein 1994), and hence positively affects product learning. In addition to being conducive to some degree of utility for online customers, this state is also prone to hedonic value because it generates a feeling of excitement (Wang et al. 2007). A substantial body of work on the consequences of individuals' flow experiences, which are reflected by customers' curiosity arousal, provides further support for this effect (e.g., Huang 2003; Webster et al. 1993). Thus, I propose the following hypothesis:

Hypothesis 6. Cognitive curiosity increases their perceived levels of usefulness (H6a) and enjoyment (H6b).

4.5 Research Method

To test the hypotheses proposed model, I custom-developed an online shopping environment integrated with Facebook, and recruited people to become users and conduct a product search task. The website was manipulated to incorporate the features that underlie the cues described in the above theory section. Social capital properties (centrality and quality) freely varied between users.

4.5.1 Overview of experimental Setting

The created SN-enabled shopping website used restaurants as products and the Facebook social network as the underlying social ties linking subjects. To build a user base for this website, I advertised the study in a large North American city, using offline means (e.g., postings at my university, located in the city), and the Facebook platform. Facebook enabled a detailed identification of the target audience: adults (> 19 years old), living in the city, who revealed an interest in food and restaurants, and who had a Facebook account. In order to obtain some degree of natural social interdependency in the user base (necessary to test my theory), I prompted explicit and implicit friend referral. Explicit referral involved asking participants to share the study with their friends on Facebook. Setting up the campaigns to display ads in priority to the Facebook friends of the existing user base (after a few days of running the campaign) enabled implicit referral.

All individuals who subscribed to the study were first asked to review restaurants they knew of (i.e., what they liked, disliked, general rating, whether they would recommend it, comments) among the 287 that were included in the list (generated based on a popular restaurant festival in the city). After reviewing restaurants, subjects answered a brief questionnaire that captured demographics (e.g., age, gender) and other control variables (e.g.,

frequency of eating out). Once the recruiting and preliminary restaurant review task were completed (it took approximately two months), I contacted a sample of individuals from this user base to invite them to use my website for a restaurants search and selection task. Descriptions of the network sampling procedures, experimental task, website design's key features, and variables measures are presented next.

4.5.2 Sampling

To ensure the sampling of a representative set of subjects, I divided the website user base (356 people) into six strata[21] according to the number of Facebook friends they had on the experimental website. Stratification consists in splitting members of a population into non-overlapping homogenous subgroups before sampling. All eligible[22] network members were assigned into one stratum from which I subsequently randomly sampled. This method of sampling participants was deemed appropriate as it does not influence the social or informational environment made available to subjects during the experimental task (Gray et al. 2011).

4.5.3 Experimental Task

Using the web to help choose a restaurant is a common task that was chosen to enhance the study's ecological validity (Rainie et al. 2011). Hence, subjects were asked to browse the site to search for new restaurants to try out, filling a wish list to validate their selection and proceed to the questionnaire. In order to stimulate search[23], subjects were probed (before I

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[21] One included all isolates (53 of them) in the network (i.e., those with no social connections), three others included subjects with one (80), two (63), and three (40) friends respectively, a fourth one with (50) subjects connected to four or five friends, a fifth one included those (50) that had between six and 11 friends, and a final stratum was composed of (16) subjects connected to more than 12 friends.

[22] Among the 386 people who participated to both the restaurant review and survey in the preliminary stage of the study, 34 participants either did not allow us to contact them again or were identified as survey speeders.

[23] The observation that some consumers know or recognize the products they want has been reported in prior research (e.g., Senecal et al. 2005; Todd 2007).

disclosed the study's task) to write down a 'mental wish list' of restaurants they could think of for trying out in the future. The website design prevented subjects from adding restaurants they knew already (i.e., reviewed in the study preliminary task) or that they had included in their mental wish list (a manual check was performed to ensure this did not happen). Restaurant vouchers were used as incentives. They were redeemable at the restaurants identified in the mental wish list or those selected during the task. Finally, before the task started, a tutorial informed subjects about the website's key interaction elements.

4.5.4 Platform Design

Three variations of my website were designed and used for the purpose of this study. The first version was a simple, open SN-enabled site: it provided access to all restaurants, all consumers, and all resources (i.e., restaurant reviews), and enabled users to freely traverse the network by showing users' list of social connections in their profile page. The second version featured all the characteristics of the first version and included an additional page showcasing a list of *featured restaurants*, identified based on the number of shoppers that visited and reviewed them. The third version also combined all the features of the simple open network, and offered an additional access to a list of *featured shoppers*, identified based on their reviews' quantity (i.e., the number of restaurants they went to and reviewed) and quality (i.e., whether they wrote textual comments).

These three versions of my experimental website were chosen so that they are representative of the possible diversity via which an open network might be implemented (that is, with potentially different access points to products and resources), and, importantly, so that they share the key property of providing similar means to access friends and resources. Hence, exposing subjects to these three versions of the site enabled assessing the average effects that

occur within open SN-enabled environments, and contributed to increase the generalizability of the findings. Statistical tests (further reported in section 4.6.1) support the homogeneity of subjects' perceptions of the website affordances and of behaviors across the three instances of the My Table open network.

Table 4.2 specifies the features included in the experimental website, and Figure 4.4 illustrate two of these: the list of friends and the social filtering tools. Screenshots of the featured shoppers and featured restaurants pages are available in Appendix H.

Table 4.2 Key Feature Designed into the Experimental Platform (Paper #3)

Versions of the Website	Features
Open network	• List of profile page: includes a list of her Facebook social connections • Product filters: attribute-based filtering + social feed. • Other shoppers' profile pages: the user can see and traverse the list of friends of all other shoppers. • UGC: the subject can access reviews created by any other shopper.
Open network + access to featured restaurants	• Same as the simple open network • Adds a list of featured restaurants that users can access via the main menu
Open network + access to featured users	• Same as the simple open network • Adds a list of featured shoppers that users can access via the main menu

Figure 4.3 The "List of Friends" Feature

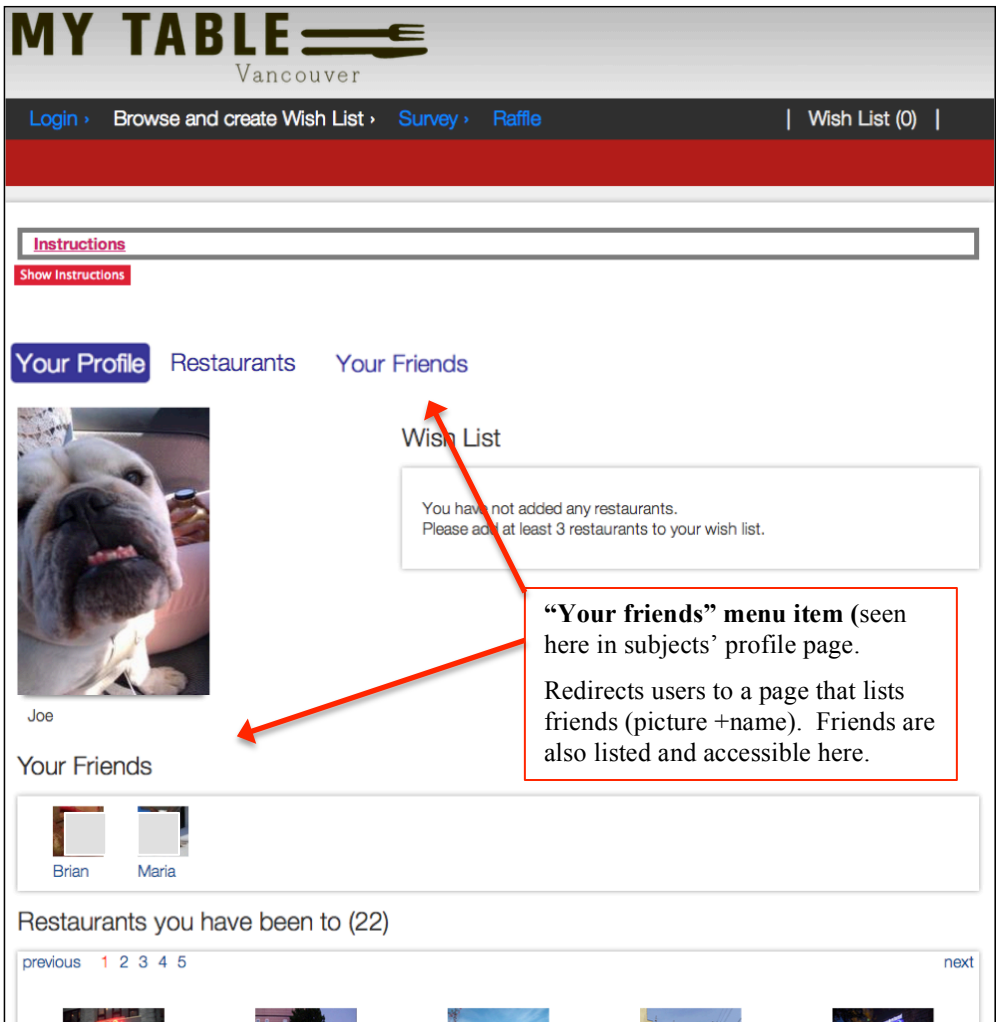
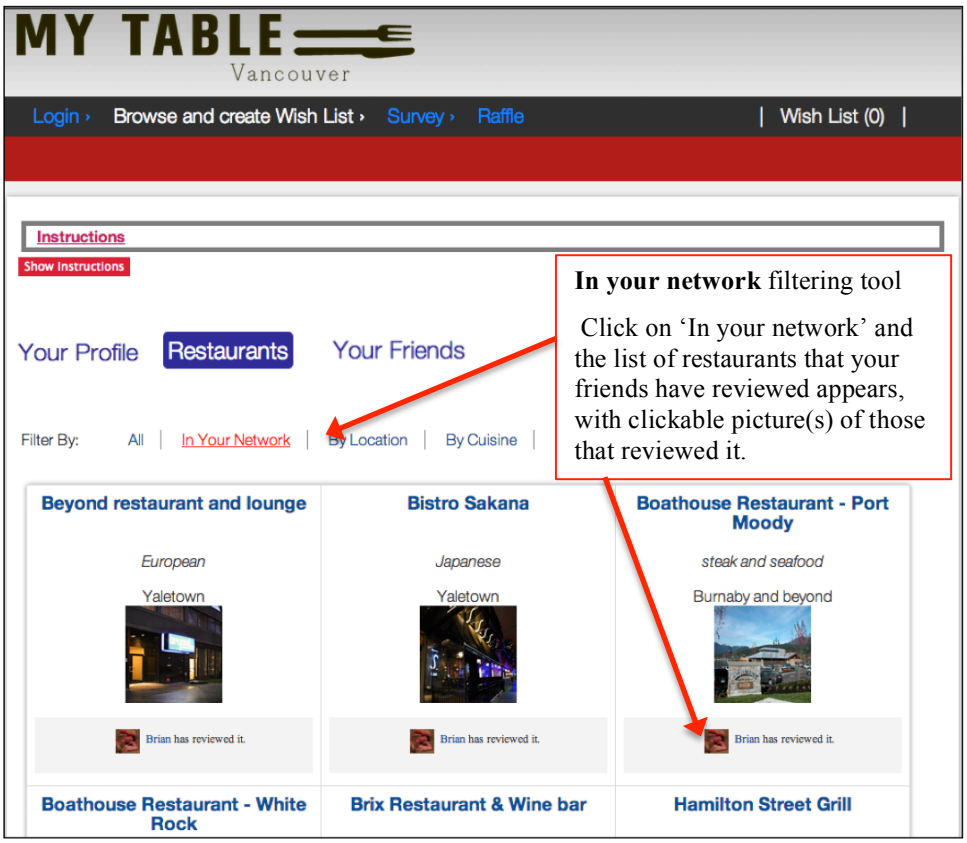


Figure 4.4 Social Filtering Tool: "In your Network" Social Feed



4.5.5 Operationalization of Variables

SN centrality was operationalized via a count of the number of subjects' direct Facebook connections (i.e., Facebook friends) incorporated within the My Table website, that is, via the *extent* of social capital *immediately* available to them (Cross et al. 2004; Wasserman and Faust 1994). *SN quality* was measured via subjects' self-reported assessment of the relevance of these social connections in the focal shopping context. The developed items were based on the existing literature, which suggests closeness (Marsden and Campbell 2012), expertise (Borgatti and Cross 2003), and similarity (Mesch and Talmud 2006) as pertinent markers of SN quality. *SN activation* was measured via an objective, computer-generated count of the restaurant reviews from friends that subjects consulted during the product search task. The

items chosen to construct the *perceived enjoyment* scale were adapted from prior e-Commerce research (Van der Heijden 2004; Koufaris 2002). The *perceived usefulness* measurement scale was derived from the existing information system acceptance literature (Venkatesh et al. 2003), with appropriate modifications to capture aspects of performance that are specifically relevant in a shopping context (i.e., gaining depth and breadth in product knowledge). The measurement of *cognitive effort* was done via the existing operationalization of effort in the context of purchase decisions (Pereira 2001; Wang and Benbasat 2009). Finally, the literature on individuals' state of cognitive absorption when interacting with information technologies was used as a basis to measure *cognitive curiosity* (Agarwal and Karahanna 2000; Webster et al. 1993). As the curiosity adjective was used on two of the three items in the original scale, it was replaced with the term 'inspiration' in one item to avoid redundancy. The measurement items for the constructs operationalized via self-reports are provided in Table 4.3. They were collected via an online questionnaire administered after subjects completed the product search task.

Table 4.3 Measurement of Perceptual Variables (Paper #3)

Constructs	**Measures** (scores were reported on seven-points scales: from disagree strongly to strongly agree unless stated otherwise)
SN quality*	The My Table site connected you to Facebook friends: -that are close to you -that are tastemakers -that are similar to you in terms of restaurants taste
Cognitive effort	Searching for restaurants using the My Table website: -was too complex -took too much time -required too much effort
Cognitive curiosity	Searching for restaurants using the My Table website: -inspired me -stirred my imagination -*stimulated my curiosity*
Perceived usefulness	Searching for restaurants using the My Table website: -was useful for improving my knowledge of the restaurants

Constructs	Measures (scores were reported on seven-points scales: from disagree strongly to strongly agree unless stated otherwise)
	-was useful for discovering restaurants that I was not aware of -made me better informed about the pros and cons of the restaurants -helped me become more aware of restaurants that were unknown to me -was helpful for making more educated judgements about the restaurants
Perceived enjoyment**	Searching for restaurants using the My Table website was: -Unpleasant ….Enjoyable -Boring … Interesting -Dull … Exciting -Tedious … Fun

* A five-point scale (not at all, not really, undecided, somewhat, very much) was used for this construct.

** A seven-point semantic scale was used for these constructs.

Italic: item removed from analysis because it loaded highly (0.75) on the perceived usefulness construct.

4.6 Data Analysis and Results

4.6.1 Study Sample: Screening and Preliminary Tests

A total of 123 participants were contacted based on the stratified network sampling procedures described in section 4.5.2. Among them, 27 did not answer my call to participate and 8 provided unreliable answers. In addition, I excluded 6 cases that were considered outliers following the criteria set forth for Cook's D and standardized residuals values in Bollen and Jackman (1990). These screening procedures yielded a sample of 82 data points, in which 10 were network isolates (i.e., zero friends) and 14 had missing value for the SN quality measures (due to an error in manipulating the post-task online questionnaire).

The analyses were conducted by pooling subjects assigned to the three versions of the experimental platform. To ensure that the three groups were homogenous, I compared them against a set of demographics variables (e.g., age, gender), the stratified network size variable (i.e., number of friends), usage variables (e.g., how many products they viewed, how many reviews they read), and subjects' perceptions about what the site afforded them to do.

The results showed no significant differences between the three groups for *age* [$F_{(2, 77)}$ = 0.42, p = 0.65], *gender* [$\chi^2_{(2, N=82)}$ = 2.26, p=0.32], *occupation* [$\chi^2_{(2, N=82)}$ =0.84, p=0.66], *frequency of eating out* [$F_{(2, 77)}$ = 1.47, p = 0.24], *number of friends on Facebook* [$F_{(2, 79)}$ = 0.33, p = 0.72], and *number of My Table friends* [$F_{(2, 79)}$ = 0.08, p = 0.92]. In addition, no difference was observed in terms of the number of *products viewed* [$F_{(2, 79)}$ = 0.64, p = 0.53], the number of *reviews* and of friends' reviews consulted [$F_{(2, 79)}$ = 1.25, p = 0.29, and $F_{(2, 79)}$ = 0.58, p = 0.57, respectively]. Related descriptive statistics are reported in Table 4.4.

Table 4.4 Descriptive Statistics for Study #3 Participants (N=82)

	Platform Version			
	Open Network	**Open Network + Featured Restaurants**	**Open Network + Featured Shoppers**	**Total**
Sample size	30	28	24	82
Age avg (std)	27.77 (7.6)	26.26 (5.02)	27.26 (5.5.)	27.11 (6.19)
Gender male female	11 (36.7%) 19 (63.3%)	10 (35.7%) 18 (64.3%)	13 (54.2%) 11 (45/8%)	34 (41.5%) 48 (58.5%)
Occupation non students students	17 (56.7%) 13 (43.3%)	13 (46.4%) 15 (53.6%)	11 (45.8%) 13 (54.2%)	41 (50%) 41 (50%)
Eat out frequency* avg (std)	4.34 (1.26)	4.07 (1.03)	4.61 (1.08)	4.33 (1.12)
# Facebook friends avg (std)	429 (289)	463 (369)	507 (395)	464 (347)
# Friends on My Table avg (std)	4.10 (5)	3.68 (3.7)	4.08 (4.4)	3.95 (4.4)
# Products viewed	6.2 (6.9)	6.39 (4.07)	5.08 (2.5)	5.94 (4.95)
# Reviews accessed	12.6 (18.2)	18.1 (22.1)	10.0 (18.8)	13.7 (19.8)
# Reviews from friends accessed	4.5 (9.9)	5.46 (8.4)	3.6 (8.9)	4.55 (9.1)

* The eat out frequency variable was assessed via the following item and scale: *How frequently do you go out for lunch or dinner in Vancouver*: (1) Never, (2) Less than once a month, (3) Once a month, (4) A few times a month, (5) Once a week, (6) A few times a week, (7) Everyday.

A set of five questions (MC1 to MC5) was included at the end of the post-task survey in order to assess subjects' perceived awareness about key actions afforded by the manipulated websites (e.g., navigation and access to product reviews). No significant between-groups difference was anticipated. This was confirmed by the ANOVA results that indicated no difference in subjects' perceived ability to filter products via attribute filters [MC1 - $F_{(2, 79)}$ = 1.363, p = 0.262], to reach content produced by non-friends [MC2 - $F_{(2, 79)}$ = 1.426, p = 0.246], to see a list of their friends [MC3 - $F_{(2, 79)}$ = 0.147, p = 0.863], to see lists of their friends' friends, [MC4 - $F_{(2, 79)}$ = 0.151, p = 0.86)], and to filter restaurants that their friends reviewed [MC5 - $F_{(2, 79)}$ = 0.224, p = 0.80]. Descriptive statistics are reported in Table 4.5.

Table 4.5 Descriptive Statistics (Perceived Affordances – Paper #3)

Versions of The SN-Enabled Sites / **Variables**	Open Network N=30		Open Network + FR N=28		Open Network + FU N=24	
	Mean	STD	Mean	STD	Mean	STD
MC1	5.57	1.22	5.57	1.27	5.08	1.05
MC2	5.40	1.43	5.71	1.16	5.08	1.36
MC3	6.07	0.93	6.04	1.13	5.92	0.98
MC4	5.00	1.50	5.11	1.27	4.92	1.00
MC5	5.37	1.21	5.21	1.10	5.17	1.21

Keys:

FR: Featured Restaurants; FU: Featured Users

The items took the form of 7-point Likert scales with anchors from "1. Definitely not", to "7. Definitely yes" and introduced by the following question "Does the My Table website make it possible to..."

MC1 (attribute filtering): Filter restaurants according to neighborhood or cuisine preferences

MC2 (availability of content): See restaurant reviews written by people I did not know

MC3 (list of friends): See a list of my social connections (i.e. my friends)

MC4 (list of friends' friends): See a list of my friends' social connections (i.e., their friends) in their profile page

MC5 (social filtering): Filter restaurants to display those that my friends reviewed

In summary, this preliminary analysis indicates that the three sub-groups of subjects in the study sample were homogenous in terms of subjects' demographics, personal network size,

website usage, and website's perceived functional affordances. I could then proceed with testing the hypotheses.

4.6.2 Results

Structural equation modeling (SEM) was used to analyze the data. SEM affords evaluating the significance and strength of causal relationships between one or more independent variables and one or more dependent variables, that is, when several constructs are considered together in a single, and possibly multi stage, model (Fornell and Larcker 1981). Partial least squares (PLS) is a SEM technique well-suited to my study's context (e.g., robust to small sample sizes, appropriate for early stage research) (Henseler et al. 2014). Thus, it was used for assessing the convergent and discriminant validity of the study's constructs, as well as for hypothesis testing[24].

All perceptual constructs were modeled via latent variables and their reflective items. Therefore, the measurement model was tested by estimating the constructs' internal consistency as well as convergent and discriminant validity. The results showed that the typical validity indices were all above recommended thresholds: as reported in Table 4.6, Cronbach's alpha (CA) (Nunnally and Bernstein 1994) was above 0.70, composite reliability (CR) was above 0.80, the average variance extracted (AVE) was above 0.50, and the square root of their AVE was superior to the inter-construct correlations. Those results provided supporting evidence for the constructs' convergent and discriminant validity (Fornell and Larcker 1981). In addition, the item standardized loadings (Table 4.7) all exceeded the recommended minimum of 0.70 and were higher for the constructs they were supposed to

[24] The SmartPLS 2.0 (Ringle et al. 2005) software was used to analyze the data.

measure than for any other (Barclay et al. 1995). Appendix I reports the distribution of the variables involved in testing the research model.

Table 4.6 Correlations, Internal Consistency, and Discriminant Validity of Constructs

	CR *(>0.70)*	***CA*** *(>0.70)*	***AVE*** *(>0.50)*	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
SN quality **[1]**	*0.88*	*0.81*	*0.72*	**0.85**						
In-degree centrality **[2]**	-	-	-	0.36	-					
SN activation **[3]**	-	-	-	0.37	0.59	-				
Cognitive effort **[4]**	*0.93*	*0.88*	*0.80*	-0.39	-0.23	-0.26	**0.89**			
Cognitive curiosity **[5]**	*0.91*	*0.81*	*0.84*	0.30	0.15	0.14	-0.40	**0.92**		
Perceived usefulness **[6]**	*0.90*	*0.86*	*0.65*	0.42	0.37	0.27	-0.42	0.53	**0.81**	
Perceived enjoyment **[7]**	*0.95*	*0.93*	*0.82*	0.40	0.35	0.36	-0.62	0.56	0.60	**0.91**

CR: Composite Reliabilty. *CA*: Cronbach's Alpha; *AVE*: Average Variance Extracted. Diagonal elements (in bold) are the square root of the shared variance between the constructs and their measures (i.e., square root of the AVE); off-diagonal elements are correlations between constructs.

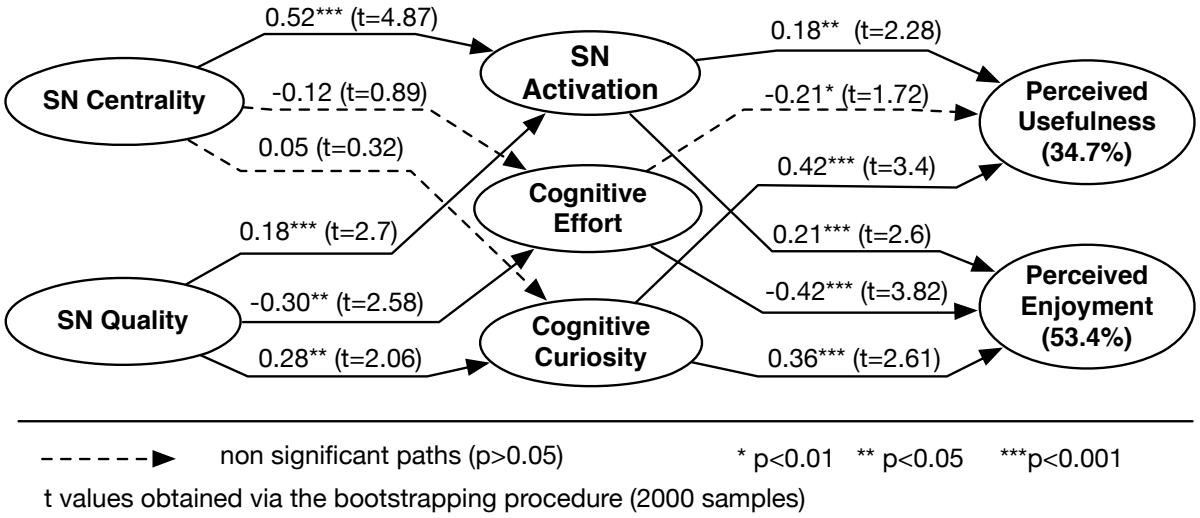
Table 4.7 Constructs Loadings and Cross Loadings

	SN Quality	**Cognitive Effort**	**Cognitive Curiosity**	**Perceived Usefulness**	**Perceived Enjoyment**
SNQ1	**0.88**	-0.25	0.33	0.43	0.40
SNQ2	**0.92**	-0.35	0.28	0.31	0.35
SNQ3	**0.74**	-0.30	0.05	0.38	0.22
EFF1	-0.26	**0.88**	-0.45	-0.38	-0.56
EFF2	-0.35	**0.91**	-0.42	-0.48	-0.58
EFF3	-0.30	**0.91**	-0.32	-0.24	-0.52
CURIO1	0.29	-0.45	**0.94**	0.53	0. 58
CURIO2	0.25	-0.27	**0.89**	0.43	0. 41
PU1	0.14	-0.27	0.49	**0.76**	0.45
PU2	0. 34	-0. 32	0.53	**0.85**	0. 57
PU3	0. 37	-0. 32	0.47	**0.86**	0. 53
PU4	0. 45	-0. 43	0.27	**0.75**	0. 41
PU5	0.40	-0.36	0.31	**0.76**	0. 39
PE1	0.34	0.61	0.48	0.56	**0.88**
PE2	0.38	0.55	0.50	0.58	**0.90**
PE2	0.39	0.48	0.47	0.51	**0.90**
PE4	0.32	0.59	0.56	0.51	**0.92**

The results of the structural model (Figure 4.5) reveal that *SN centrality* significantly influenced SN activation (β=0.52, $p<0.001$), while its effects on cognitive effort and curiosity were not significant (β=-0.12, $p>0.05$, β=0.05, $p>0.05$, respectively). Hence, while

H1a was supported, H3a and H5a were not. In turn, *SN quality* had a positive effect on SN activation (β=0.18, p<0.001) and cognitive curiosity (β=0.28, p<0.05), and a negative effect on cognitive effort (β=-0.30, p<0.05). Thus, H1b, H3b, and H5b were all supported. Given the nature of the SN activation variable (objective count measure), I conducted supplementary tests of H1a and H1b, using negative binomial regressions. The results (reported in Appendix J) corroborate what was found via PLS.

Figure 4.5 Results for the Hypothesized Paths

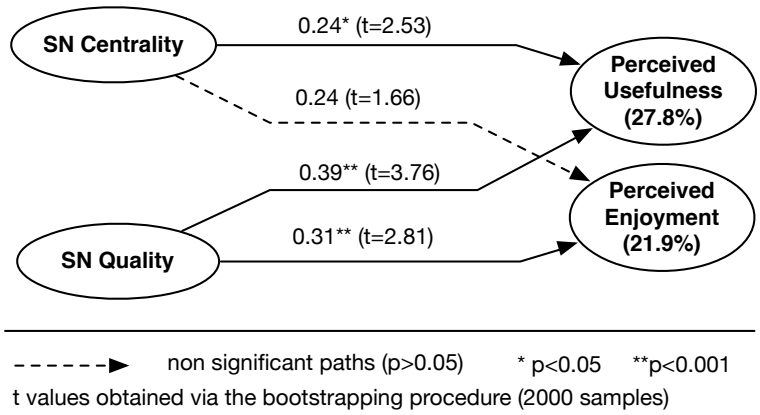


Next, *PU* appeared to be significantly influenced by SN activation (β=0.18, p<0.05) and cognitive curiosity (β=0.42, p<0.001). The negative effect of cognitive effort was not significant (β=-0.21, p<0.01). Therefore, H2a and H4a were supported while H6a was not. Finally, *PE* appeared to be significantly affected by the three proposed explanatory factors: SN activation (β=0.21, p<0.001), cognitive effort (β=-0.42, p<0.001), and cognitive curiosity (β=0.36, p<0.001). These results bring support to H2b, H4b, and H6b. Overall, the model explained a substantial amount of variance in PU (34.7%) and PE (53.4%).

Following-up on these results, I examined two other models to determine if the data supported a full mediation of the effects of social capital on consumer's utilitarian and hedonic outcomes through the three posited value-creation mechanisms.

In the first model (Figure 4.6), which included only the direct effects of social capital on PU and PE, I found that SN centrality did not significantly influence PE. Hence, ***the preliminary necessary condition of a mediation effect was not met for the relationship between SN centrality and hedonic outcomes***. The three other direct paths were all significantly positive (SN centrality→PU: β=0.24, $p<0.05$; SN quality →PU: β=0.39, $p<0.001$; SN quality→PE: β=0.31, $p<0.001$). Thus, I examined whether these three paths remained significant or not in a full model (direct + indirect effects), explained next.

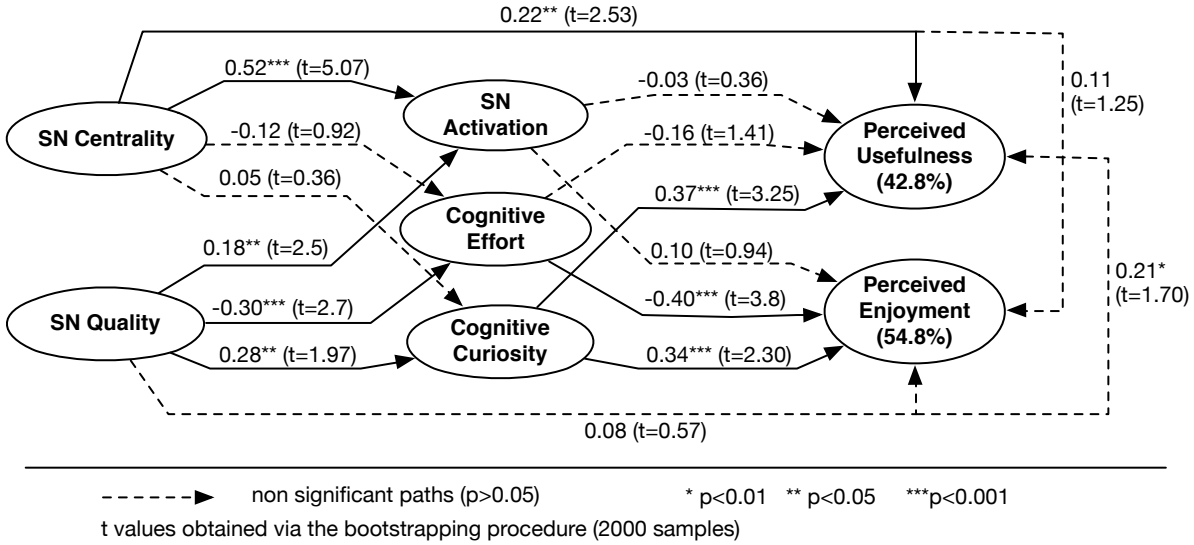
Figure 4.6 Results for the Direct Effects Model



The results of the second model illustrated in Figure 4.7 (direct + indirect paths) show two important things. First, the two direct paths from SN quality to PU and to PE became non-significant (β=0.21, $p>0.05$, and β=0.08, $p>0.05$, respectively). Some mediators also became nonsignificant, suggesting that ***SN quality's influence on both PE and PU was fully mediated by cognitive effort and cognitive curiosity for PE, and by cognitive curiosity***

alone for PU. Second, the path from SN centrality to PU remained significant (β=0.22, p<0.05), suggesting that ***while SN centrality did influence PU, this effect was <u>not</u> effectively explained by the proposed set of intervening variables.***

Figure 4.7 Results for the Full (Direct + Indirect Effects) Model



4.7 Discussion

This research investigated how online social relationships facilitate useful and enjoyable product search experiences. For that matter, I proposed that three value-creation mechanisms (social network activation, effort reduction, curiosity arousal) would mediate the effects of shoppers' social capital (i.e., shoppers' local centrality, and the quality of their social ties) on the degree of usefulness and enjoyment they experienced while searching for products. The empirical study was conducted in an online setting in which subjects were connected to their Facebook friends and were asked to search for new restaurants to go visit in the future. In this section, I summarize the study's key findings, clarify their contributions to practice and research, and describe their limitations and the opportunities for future research.

4.7.1 Findings and Implications

Before considering mediating effects, I first discuss the findings associated with the upstream (i.e., from social capital to the three mediating variables) and downstream effects (i.e., from the mediators to PU and PE) that were proposed in the research model. Table 4.8 synthesizes these results.

Table 4.8 Summary of Results

A. Upstream effects

		Dependent Variables		
		SN activation	**Cognitive effort**	**Cognitive curiosity**
Independent variables	**SN Quality**	Supported (H1a)	Supported (H3a)	Supported (H5a)
	SN Centrality	Supported (H1b)	Not supported (H3b)	Not supported (H5b)

B. Downstream effects

		Dependent Variables	
		Perceived usefulness	**Perceived enjoyment**
Independent variables	**SN activation**	Supported (H2a)	Supported (H2b)
	Cognitive effort	Not supported (H4a)	Supported (H4b)
	Cognitive curiosity	Supported (H6a)	Supported (H6b)

First, the results (H1a and H1b) support the view that *both* structural (i.e., SN centrality) and content (i.e., SN quality) aspects of a customer's online social capital provide salient cues that motivate shoppers to mobilize the informational resources available in their circle of friends (i.e., SN activation). As expected, I also found that SN activation had a positive effect on usefulness and enjoyment (H2a and H2b). These findings are consistent with prior social capital research that noted the importance of accounting for individuals' activation of their social network (Borgatti and Halgin 2011; Smith et al. 2012), a process that is particularly explicit when shoppers reach out to their friend's content.

Second, I found that cognitive *effort* and cognitive *curiosity* were influenced by SN quality but not by SN centrality (H3a, H3b, H5a, H5b). SN centrality did not significantly influence cognitive effort and cognitive curiosity even when removing the competing effect of SN quality. Thus, this suggests that compared to *size* aspects, the *relevance* of one's social circle provides more effective cues to (i) support information-seeking strategies that are less costly, and (ii) trigger an information gap and stimulate exploration. As these two aspects were not directly captured (i.e., measured), this interpretation needs to be considered with caution, which I discuss further in the Limitations section.

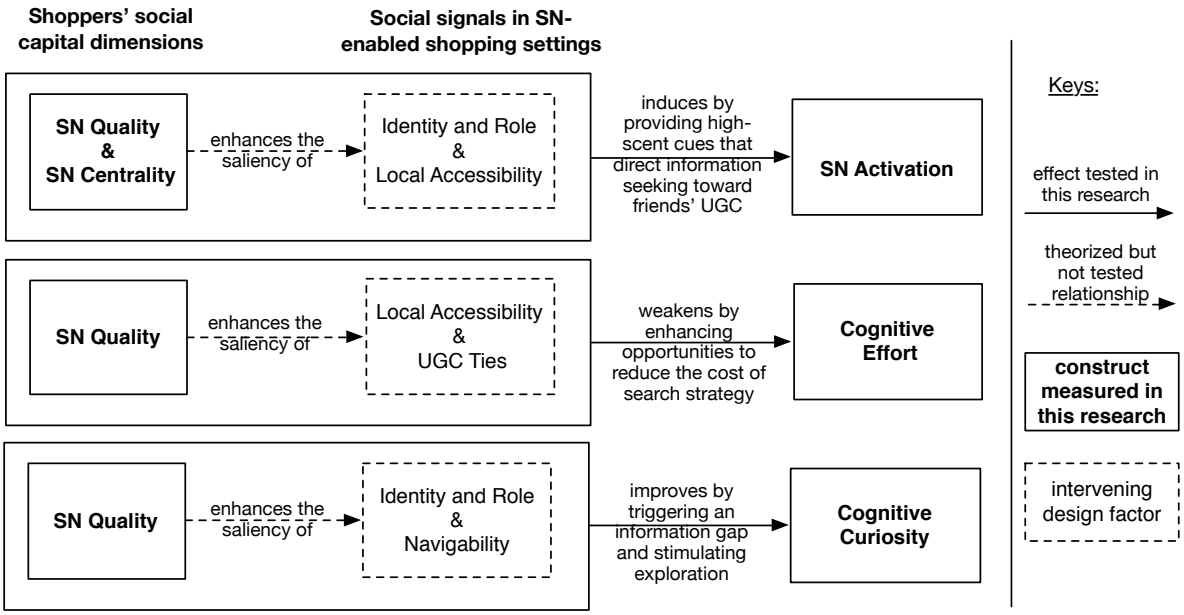
Third, the results corroborate my expectation that cognitive curiosity is a positive driver of both usefulness and enjoyable customer experiences (H6a, H6b). However, I expected that cognitive effort would be a significant detrimental factor to both outcome variables, and my results only supported its negative effect on PE (H4a, H4b). To further explore this result, I tested a model with cognitive effort as a single mediator, and its effect on PU appeared to be significant. In sum, the results are not in conflict with past research that observed a negative relationship between effort and PU (e.g., Van der Heijden 2004). What likely happened is typical of multiple regression models in which the independent variables 'compete' with one another to be explanatory of their targeted construct. That is, the effect of cognitive effort on PU was overtaken by the competing influences of SN activation and curiosity[25].

Figure 4.8 summarizes the significant effects that were observed in this study.

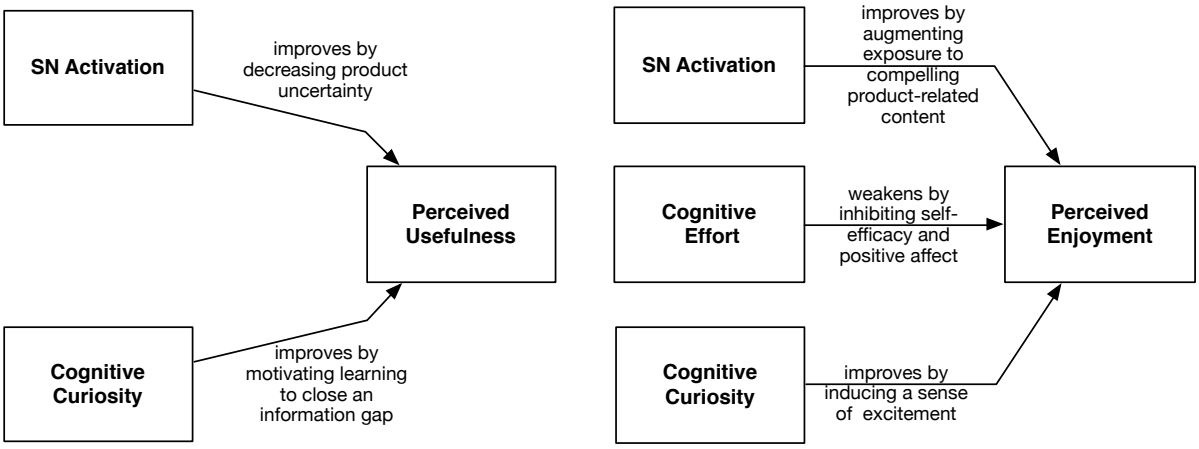
[25] The correlations between PU and cognitive effort, UGCf consulted, and cognitive curiosity were r=-0.42, r=0.27, and r=0.53, respectively, as per Table 4.6.

Figure 4.8 Summary of Effects Supported in the Study

A. Upstream effects

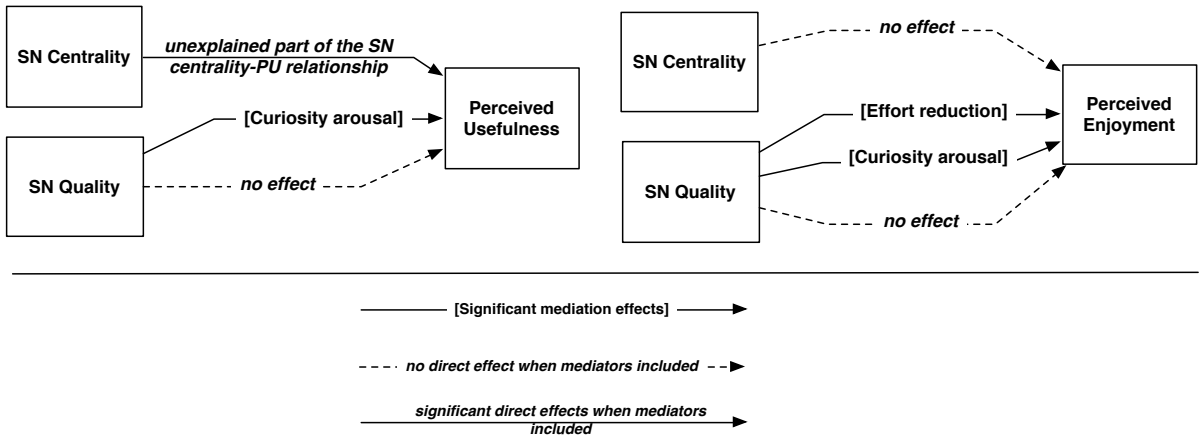


B. Downstream effects



In most situations, it is unlikely that the effect of an independent variable on an outcome is enabled by a single mechanism. In this study, I expected that three intervening mechanisms would explain the influence of online shoppers' social capital on the quality of their product search experiences. The findings, illustrated in Figure 4.9, were mixed.

Figure 4.9 Synthesis of Mediation Effects



Regarding PU (left part of Figure 4.9), I found that cognitive curiosity fully mediated the effect of SN quality while both SN activation and cognitive effort did not mediate this relationship. In addition, none of three proposed mediators could explain the observed effect of SN centrality on PU as the direct effect of SN centrality on PU remained significant after adding the mediators in the model. A possible reason for this observation is the omission of more effective intervening variable(s) for this effect. An alternative explanation is the presence of a halo effect whereby shoppers may think that PU should be higher in the presence of a larger network of friends. That would explain that SN centrality significantly influenced SN activation, which in turn significantly influenced PU, but SN activation did not influence PU when the direct effect of centrality on PU was taken into account.

Regarding PE (right part of Figure 4.9), I found that cognitive effort and cognitive curiosity fully mediated the effect of SN quality, while SN activation played no intervening role in the relationship. In addition, effect of SN centrality on PE was not even significant in a single direct effect model. This could be due to a power issue given the small size of the sample and the non-negligible size of the beta weight for this causal path (0.24, t=1.66). Another

possible explanation is the limited range of values in my sample for the SN centrality variable as subjects were connected on average with four friends. I return to this point when discussing the study limitations (Section 4.7.3)

All together, the results showed that the proposed explanatory mechanisms better applied to the *qualitative* effects of online social relationships on PU and PE, and that *curiosity arousal* was essential in generating useful and enjoyable product search experiences.

4.7.2 Contributions

This study makes a number of contributions to research and practice. First, it substantiates and explains the role of social capital in influencing consumers' experiences in SN enabled settings by empirically demonstrating consumers' sensitivity to social cues especially when they are most relevant to them (a per the effects of SN quality). This was made possible by creating and observing a natural SN of interconnected consumers in a relatively controlled setting, which, to my knowledge, was never done before. An interesting part of science is to explain how things come about. In that regard, this research contributes to our understanding of how online social relations come to influence consumers' perceptions of usefulness and enjoyment when using a SN-enabled shopping site for product search. This study found that not all roads lead to Rome, as certain mediators were not (i.e., SN activation) or less consistently (i.e., cognitive effort) instrumental in explaining the effects on usefulness and enjoyment. It also revealed that one starting point (SN centrality) was less influential than the other (SN quality), and that some roads remain unknown (as the direct and unmediated effect of SN centrality on usefulness indicated). These findings are informative for future theory building efforts in the domain of social commerce.

Second, this study demonstrates that online friends are generative of value in shopping contexts. This might be counterintuitive in light of existing well-established SN theories that have advocated the utility of weak ties in providing access to novel knowledge in offline settings (Granovetter 1973) as well as in the context of digital networks (Gray et al. 2011). Yet, other SN theories advocate that social capital is rooted in networks of strongly interconnected elements where strong ties (e.g., close friends) facilitate trust, reliable communication, reciprocity, and norms compliance (Coleman 1988). This study concurs with and brings support to the view that neither of these positions should be taken for granted, and that, instead, context should inform the identification of the resources instrumental for certain actors with certain goals in certain situations (Borgatti and Kidwell 2010). In the online shopping context, I explained that (and how) online friends (those who are the most familiar to shoppers amongst all other users) represent valuable resources. Thus, the findings about the influential role of SN quality bring some additional support to the soundness of this explanation.

Third, this study builds on and extends Kane et al.'s (2014) framework of prototypical social media network features to identify four generic social signals of SN-enabled shopping settings (identity and social role, local accessibility, navigability, UGC ties). The intertwined role of these signals with social capital (i.e., the extent and relevance of shoppers' social ties) informed explaining the effect of social capital on the three proposed mediating variables. While the effects of several social cues (e.g., human warmth, similarity, etc.) on customer experience have been studied, the effects of those emerging as a result of integrating a SN into a shopping environment have received much less attention.

This research is also informative for practitioners. I observed that consumers' perceived usefulness and enjoyment were influenced by the extent and quality of the social network into which they were embedded, and also noticed that quality had the most consistent effect. This is an important finding for e-retailers because shoppers' perceived value is known to influence key indicators of business performance such as patronage behaviors (Overby and Lee 2006), intentions to pay for services (Lu and Hsiao 2010), and competitive advantages (Woodruff 1997). Thus, online retailers who are planning social commerce initiatives should ensure that the mechanisms supported by their platforms to connect shoppers' connections promote this sense of quality in social ties. The integration with the Facebook social network platform is expected to be useful in that regard because it is actively used by 1.3 billion people[26], connected on average to 338 friends (Smith 2014), who include those they share offline interests and experiences with (Ross et al. 2009).

4.7.3 Limitations and Future Research

This research has some limitations that readers should be aware of when interpreting my findings. First, the three mediators were proposed as independent factors. While my data did not indicate strong correlations between these,[27] one could argue that SN activation precedes both cognitive curiosity and cognitive effort. SN activation refers to the magnitude of friends' content being consulted during product search. One should keep in mind that this is only <u>one</u> aspect of information seeking and of inference making about products, which also includes acquiring content provided by the platform (e.g., product description), content created by non-friends, as well as observing relationships (e.g., UGC links). An interesting

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[26] Source: Facebook (January 1, 2014)

[27] r(SN activation, cognitive effort) = -0.26; r(SN activation, cognitive curiosity) = 0.14; r(cognitive effort, cognitive curiosity)= -0.40

research avenue would be to examine if there is any difference in the effect of acquiring UGC from friends vs. non-friends on cognitive effort.

Second, my findings regarding the effects of SN centrality on mediators and outcomes disconfirmed several of my expectations. SN centrality represents the potential resources directly available to a customer, and was measured with the number of friends to who a customer was linked on the shopping platform. In my sample, most subjects had between one and three friends. Few had more than five friends. Hence, my results for the effect of this variable are strongly constrained by its range in my study and cannot be generalized to networks of larger sizes.

Third, my sample size was relatively small, which reduced the power of my tests. Among the 82 cases that resulted from cleaning the data, 10 were network isolates (i.e., zero friends). Hence, 72 usable data points were used in the PLS tests, which could cast doubt on the stability of the obtained estimates, or suggest a greater degree of relevance to the findings (i.e., the effects were large enough to be detected). Cleaning up the data from outliers (as explained in section 4.6.1) helped alleviate concerns about estimates' stability.

In sum, as the two aforementioned limitations revealed, I faced the typical tradeoffs in empirical research between control and generalizability, and I acknowledge that while this study scored relatively high on the former criterion it has important limits on the latter. A programmatic approach to research will be an effective way to deal with this issue (Jarvenpaa et al. 1985). For that matter, future research would need to study shopping settings in which customers are connected to a larger number of online friends. The effect that the number of peers in one's online social circle has on usefulness was not explained effectively by my proposed mediators, and one possibility is that the effect could kick in at

levels of SN centrality not available in my sample. Field studies would probably be the most appropriate research strategy to employ better understand this effect. In addition, other opportunities lie in studying in greater detail the mechanisms via which social cues affect cognitive effort and cognitive curiosity. For example, process tracing methods (Todd and Benbasat 1987) could help capture the search strategies actually being employed by online customers in SN-enabled settings, and researchers could look at how they correlate with the levels of cognitive effort being perceived by these customers. Also, the use of eye tacking (Cyr et al. 2009) or other neuroscience approaches (Dimoka et al. 2012) could help capture in more detail the processes by which social cues trigger cognitive curiosity or related dimensions (e.g., temporal dissociation, focused immersion)

4.8 Conclusion

SN-enabled shopping is a new phenomenon that triggers an increasing interest from online shoppers and retailers, but the functioning and value potential of which remain largely unknown. The present study has provided detailed insights on how two independent aspects of shoppers' social capital (centrality and quality) influence two important value outcomes of consumers' product search experiences: the usefulness and enjoyment they generate. I found that the two aspects of social capital, and the three proposed intervening factors (mobilizing friend' informational resources, effort reduction, and curiosity arousal) did not equally influenced usefulness and enjoyment. Of particular importance, curiosity arousal appeared to constitute a consistently effective value-creation mechanism explaining the positive effect of social ties' quality on both usefulness and enjoyment. The results for the effects of centrality were less conclusive and open interesting paths for future research.

Chapter 5: Conclusion

5.1 Dissertation Summary

The two research goals that I set at the beginning of the thesis were to develop clearer conceptual foundations for the study of social commerce, and to start addressing important empirical questions with respect to its impact on consumer experience. I was motivated by the observation that while there is a growing interest in social commerce, its understanding remains as yet not complete and its value potential lacks both explanation and evidence.

The objectives of the first paper in this thesis (***Paper #1***) were twofold: (1) to develop a better understanding of the scope and the seemingly multifaceted nature of social commerce, and (2) to outline the key user actions driving value from a consumer as well as from a business perspective. I started by reviewing current work in the domain of online social commerce, and observed that researchers did not agree on its scope (e.g., does it include shoppers or sellers) and did not sufficiently address its uniquely different nature. Thus, I saw value in proposing an integrative and network-focused conceptualization. In doing so, I developed the construct of online social commerce networks (OSCNs), defined as *online environments in which consumers and business actors connect and interact among and between each other, forming an intricate set of interconnected digital network structures.* The content of this construct emphasizes two key facets of social media (i.e., IT artifacts and social networks) while acknowledging the specificity of the focal context (i.e., commerce). I identified eight prototypical OSCN structures (see Figure 2.1 p. 31) from an analysis of the actors involved in social commerce and the types of ties that may link them. Next, "Connect & Engage" and "Listen & Extract" were specified as the two key IT-mediated actions involved in the creation and exploitation of these structures. They were incorporated into a

framework, which delineated their influence in fulfilling the needs of customers and business actors, as well as the facilitating effects of IT capabilities associated with the design of network structures. The proposed framework contributes by offering a systematic and inclusive take on the phenomenon, two aspects that appeared to be lacking in prior research. It can also assist practitioners by helping them crafting their social commerce strategy and justify and assess the usefulness of their investments.

The first empirical study of the thesis (***Paper #2***) investigated whether SN-enabled shopping sites are better able to induce diagnostic and serendipitous experiences compared to non-SN ones. An online experimental set-up was developed, in which two types of designs (private vs. open networks) were applied to a SN-enabled shopping platform and compared to a platform that did not incorporate SN features. The size of shoppers' personal network (i.e., friends) was also taken into account. This inclusion of the network design variable was motivated by the observation that private networks are based on a long-standing assumption (i.e., the selective disclosure of information) concerning offline networks but does not need to hold in digital settings where open networks are common. The addition of SN size as a moderating variable came from observing that while information seekers start on equal informational grounds in typical online shopping settings, they do not in SN-enabled ones. The results revealed that SN-enabled design with both open and private boundaries yielded higher levels of serendipity. No such benefit was observed for the case of diagnosticity but additional exploratory analyses indicated that private networks might be more efficient (i.e., similar levels of diagnosticity were obtained with much lower amount of user-generated information consulted). Finally, I observed an important shortcoming of private networks: both diagnosticity and serendipity were found to be more strongly contingent on consumers'

SN size than open designs. Platform owners need to be aware of the contingent effect of such design decisions on consumer experience.

While Paper #2 placed a strong focus on comparing design effects (non SN-enabled vs. private and open network designs), ***Paper #3*** concentrated on the effects of social ties in SN-enabled shopping settings designed with open boundaries. I considered that socially embedded shoppers benefit from different levels of social capital based on who is immediately available to them (i.e., their centrality in the SN) and also how relevant they are (the quality of their SN). I further theorized about the role of three intervening mechanisms (social network *activation*, effort *reduction*, and curiosity *arousal*) in explaining how such differences in social capital influence the extent to which shoppers' product search experiences are useful and enjoyable. The empirical examination was based on the same platform as for Paper #2, i.e., a custom-developed website with restaurants as products and shoppers' Facebook social ties as the underlying SN. The results were mixed as they showed that the two aspects of social capital, and the three proposed intervening factors did not equally influence usefulness and enjoyment. Hence, exploring the paths from social capital to customer value in SN-enabled shopping settings revealed that *several roads, but not all, lead to Rome*, and *some roads remain inaccessible*, which creates interesting future research avenues.

5.2 Contributions

This thesis offers a number of research contributions discussed in each of the three papers (i.e., Chapters 2, 3, and 4). The most important are summarized in Table 5.1.

Table 5.1 Thesis Contributions

#	Key Contributions of the thesis	Implications
1	Develops a theoretically-grounded typology of online social commerce network structures (paper #1).	This clarifies the nature and scope of the social commerce phenomenon.
2	Integrates several bodies of work that are relevant to the multifaceted nature of the phenomenon, e .g., the content and direction of social ties, the types of e-Commerce actors, the digital nature of the context, the value of social relationships, the sensitivity of online shoppers to environmental cues (papers #1, #2, #3).	This provides a rich (i.e., comprehensive) account of the phenomenon.
3	Develops theoretical models that are tightly linked to the phenomenon being studied, in that they account for (i) the nature of the digital network structures into which commerce actors are located (paper #1), and (ii) the digital context (e.g., available features and cues conveyed by these features) in which shoppers engage in product search (papers #2 and #3).	This affords a precise account of the phenomenon.
4	Manipulates (paper #2) or specifies (paper #3) the design of the SN-enabled shopping environment being studied, while accounting for shoppers' social natural embeddedness (papers #2 and #3) and for the salient intervening behavioral or perceptual variables mediating the effects of social relations on product search usefulness and enjoyment (paper #3).	This affords capturing variables that are important in explaining observed effects.
5	Creates a realistic approximation of the use of a popular SN platform (i.e., Facebook) in the e-commerce context (papers #2 and #3)	This enhances the external and ecological validity of my studies.
6	Provides a detailed description of the empirical set up (the custom-developed My Table website) used to test my theories (papers #2 and #3), and documents its pros and cons.	This provides useful information for future empirical research
7	Provides an empirical assessment of the value of SN-enabled settings compared to those that are not SN-enabled (paper#2).	To my knowledge, this is the first study that documents such differences.
8	Compares the effects of two different types of SN-enabled shopping platforms (private and open networks) (paper #2).	To my knowledge, this is the first study that compares two different types of digital network designs.
9	Explains how assumptions and theories from social capital (i.e., the value of social relationships) and from online human behaviours (i.e., how users seek for information and make decisions) work together (paper #3)	This provides new insights about the mechanisms via which the quality and quality of online social relations influence customer product search and its outcomes.
10	Explains the role of three value-creation processes in mediating the effects of online social relationships on customers' hedonic and utilitarian outcomes (paper #3)	

The experimental studies that compose this thesis (Papers #2 and #3) provide several methodological lesson that are supplementary but worth mentioning for future research. As the Web has become more and more open and social, users are often comfortable to contribute and share content with their community, be it of a relatively narrow scope (e.g., a few friends on Facebook) or of a larger reach (e.g., thousands of followers on Twitter). This provides opportunities for researchers in general and for those interested in social commerce specifically. In particular, this research has shown that a relatively small incentive (increasing chances to win a prize) yielded an approximate 50% of referral to Facebook friends from my participants. In addition to being naturally viral, social media networks often offer advertising mechanisms that can help reach out to a population of interest. This study used the Facebook network as a means to both target the population of interest with precision and further leverage participants to reach their friends. Hence, both natural and advertising-based friends' endorsements were shown to be not only feasible but also effective means towards the development of a natural social network to study via an experimental approach.

The network seeding procedure also revealed that researchers could benefit from considering Twitter as a means to seed and broadcast a study within a population of interest. The few Twitter users in the Vancouver restaurants community that I approached and that agreed to tweet about study generated high visibility and conversions. Unfortunately, as I was not personally involved in this community, few Twitter users responded favorably to my request. I would recommend researchers to either get involved or cooperate with people strongly tied to the online population they are targeting because people are more willing to help others that are part of their community.

The development of a shopping site connected to Facebook's social graph for experimental purposes has the advantage of offering effective referral mechanisms and providing access to an existing online social network in which millions of online users are interconnected. While my study demonstrates that creating such an experimental setting is feasible and can yield interesting findings, it is important to highlight the drawbacks of such an approach. First, the process of integrating the experimental site with Facebook is not only time and effort intensive, but also relatively risky because of two aspects. First, researchers have no control on the Facebook platform (i.e., its rules and features) and it tends to evolve rapidly and sometimes unpredictably, which can lead to extra development efforts and unexpected issues during the critical part of collecting the data[28]. Second, the natural social network created during the preliminary stage of the study represents a bounded pool of potential experimental subjects that is not easily extendable.

5.3 Limitations and Future Research

The research findings are subject to a number of limitations. First, in Calder's (1981) terms, priority in my empirical studies was given to theory 'falsification' rather than reality 'correspondence', and therefore, a limitation is that my research setting (one single instance of a social commerce site) may not be representative of the full spectrum of environmental variations present in the real world, thus possibly reducing the *generalizability* of my findings. The My Table network shared typical properties of online networks. For example, there were signs of preferential attachment and small world properties. Yet, members were

[28] For example, the mechanism that was initially developed and used to support the referral process in the preliminary stage of my study involved enabling participants to send personal notifications to selected Facebook friends. This procedure happened to be dramatically modified without notice by Facebook during the last day of testing my site, such that the notifications were sent to a much less visible area on the Facebook site. Hence, I had to postpone the data collection and implement a new mechanism (i.e., "post to your wall" – which luckily ended up being very effective). This unfortunate incident could have been much more detrimental to my project had this event happened while collecting data.

connected on average with four participants, with the majority connected to one or two friends, and a few connected to more than 12 friends. There is no doubt that real-life social shopping networks tend to demonstrate higher levels of connectedness, and my studies could not address situations in which consumers are connected to many more other consumers.

Second, while the experimental procedures created a controlled online environment and restricted the use of mobile devices to access my site, the environment in which subjects conducted the task was not under my control, therefore creating potential threats to *internal validity*. As participants were not in a lab setting, there was for example a possibility of a communication threat, that is, participants communicating with each other. A detailed review of my empirical studies' ecological, internal, and external validity is provided in Appendix K.

Third, the *meaning of the focal social connection* examined in this study (Facebook friends) remains ambiguous. Some Facebook friends can be family members, others can be colleagues, but they are all referred to as "friends". While it is easy for people to discriminate between friends and non-friends in real life, the idea of friendship has become blurrier in the context of digital networks. Hence, my results are bounded by this notion of Facebook friends as social connections and may not be applicable to environments that adopt other rules for defining 'friends'. A particularly interesting aspect that this unit of analysis raises is that, contrary to assumptions of prior SN theories, the first-degree connections on social media networks, inclusive of social shopping networks, may not be of the 'strong' type as previously defined (e.g., via frequent and intimate interactions). Given the ease with which online users can develop and maintain large social networks, social connections end up being a mix of close and less close individuals. In sum, the social network studied in this

thesis reflects both the advantages and drawbacks of studying social media networks compared to off line social networks: relational structures are more easily (and objectively) measurable but their meaning is less effectively interpretable (Kane et al. 2014).

Fourth, *social capital* was conceptualized via *local* view of centrality, that captures the extent of social capital immediately available to a focal node (Wasserman and Faust 1994). Hence it does reflect the potential social capital yielded by indirect social connections. Future research could investigate global centrality properties such as closeness centrality (i.e., how close on average a consumer is from all the other individuals in the network), or eigenvector centrality (i.e., a recursive measure in which nodes are scored more highly depending on their connections to well-connected nodes), both of which have been used in prior IS research (e.g., Kane and Borgatti 2011; Ransbotham et al. 2012, respectively). Peters et al. (2013) also suggest three social structure properties in addition to the local centrality aspect focused on in this thesis that are of theoretical importance in social media environments: connections (e.g., homophily), distributions (e.g., density), and segmentation (e.g., betweeness).

Table 5.2 describes how future research could address this limitation of this thesis.

Table 5.2 Limitations of the Thesis and Future Research Opportunities

Limitations	**Opportunities for Future Research**
Conceptual	
Limited scope of investigation	Could examine the role of other contingency factors related to customers, business actors, and product.
	Could map all existing research into the proposed framework to identify knowledge gaps and develop a complete research agenda.
Empirical	
Limited scope of investigation	Could investigate other types of SN designs, such as those that are half-private/open, i.e., when shoppers can navigate until two steps away from their network position (i.e., friends of friends). Could investigate other aspects of a shopper's social network such as shoppers' structural embeddedness (i.e., the extent to which one's friends are also related to each other) and the strength of their social ties (e.g., the frequency of real life interactions with online friends). Could investigate in more detail other aspects of cognitive absorption (e.g., control, focused immersion) that might contribute to explaining how social capital influence customer outcomes.
Internal validity	Could design a lab experiment via which more variables could be controlled (e.g., type of platform used to access the site). Could measure the proposed explanatory mechanisms via which social cues influence the mediators (e.g., measure the extent to which shoppers are in fact using cognitive shortcuts when they are offered the opportunity to do so via the visibility of friends' links with products).
Statistical conclusion validity	Could replicate the study presented in Paper#2 with a larger sample size that would help provide stronger test of the proposed interaction effects. Could replicate the study presented in Paper#3 with a larger sample size that would help re-examine the currently non-significant paths.
External validity	Could replicate the test of the proposed models in contexts in which the products are of a different nature (e.g., a product one would keep). Could investigate the proposed effects in contexts in which shopping is integrated into a SN setting (vs. a SN integrated into a shopping setting), for example a shop integrated on Facebook. Could investigate SN-enabled shopping settings in which shoppers have a much higher number of friends.

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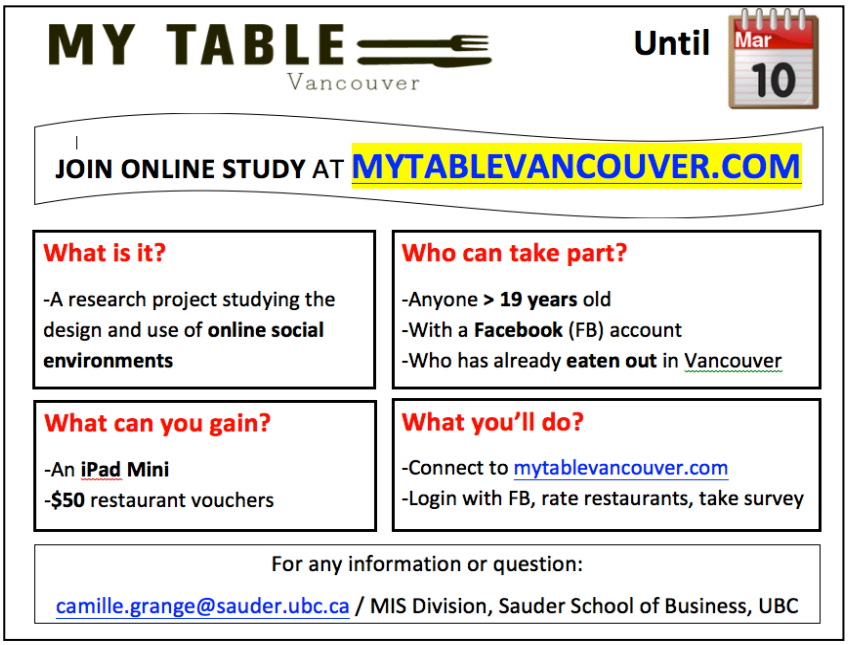
Appendices

Appendix A The 'My Table' Experimental Setup (Papers #2 and #3)

A.1 Recruiting Procedures

Printed ads (See Figure A.1) and available email lists (e.g., PhD students, a student residence, the Mathematics department graduate students) were used to reach out to the local community. In addition, a panel (about 2000 adherents – existing students or alumni at my university) was also contacted via a group email.

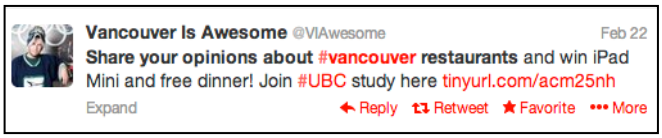
Figure A.1 Public Offline Advertising of the Study



In parallel, the holders of Twitter accounts that communicated about City and its restaurants were contacted to 'tweet' about the study[29]. Figure A.2 illustrates one of these tweets.

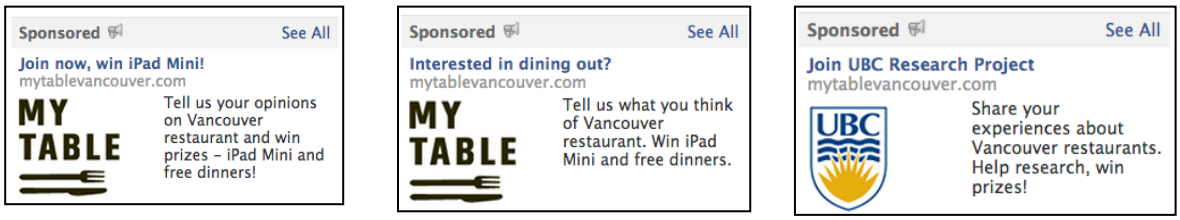
[29] @vanmag_com (informs, guides and entertains people who engage with the city), @eatmagazine (a magazine and website celebrating food & drink in British Columbia), @scoutmagazine (Vancouver's leading local website on independent food and

Figure A.2 Illustrative Tweet Promoting the Study



Next, Facebook Sponsored Ads were used to afford the recruitment of a diversified set of initial subjects, an important factor to manage sample representativeness issues when using chain referral as a method of sampling (Penrod et al. 2003). As Figure A.3 below illustrates, multiple ads were created and broadcasted on Facebook to reach out to the audience of interest.

Figure A.3 Example of Facebook Sponsored Ads Used to Recruit Participants



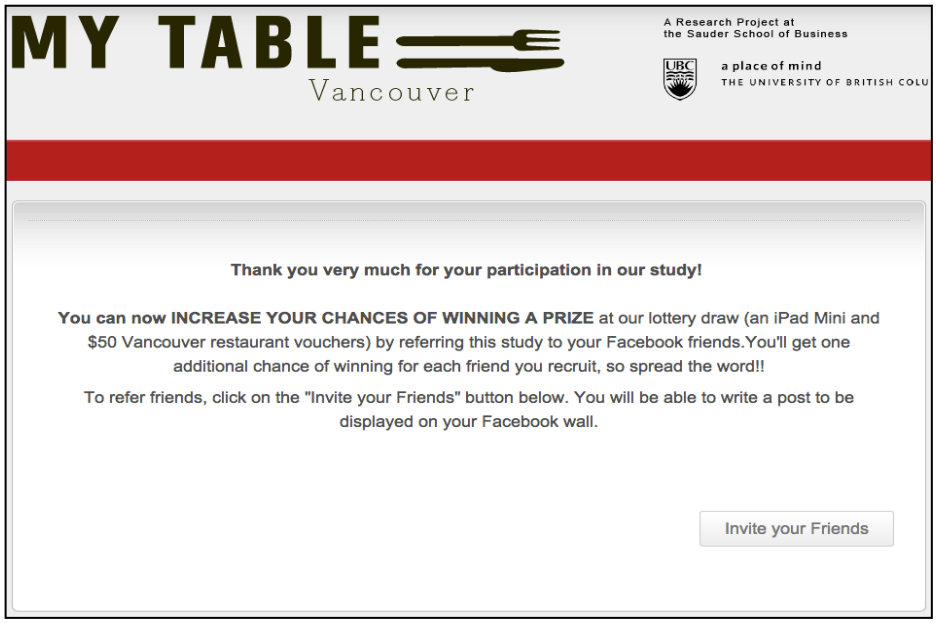
Potential Audience for this ad: 340,000 people	Potential Audience for this ad: 500,000 people	Potential Audience for this ad: 320,000 people
Who live in Canada	Who live in Canada	Who live in Canada
Who live in Vancouver, BC	Who live within 25 miles of Vancouver, BC	Who live in Vancouver, BC
age 19 and older	age 19 and older	age 20 and older
Who like dining out with friends, going out eat, #Food, going out for dinner, #Restaurant or #Foodie	Who like dining out with friends, going out eat, #Food, going out for dinner, #Restaurant or #Foodie	Who are in the broad category Food & Dining
Who are in the broad category Food & Dining	Who are in the broad category Food & Dining	

Active referral: At the end of the first phase, participants were given the opportunity to refer the study to their friends by posting it on their Facebook Timeline (45% did so). The referral

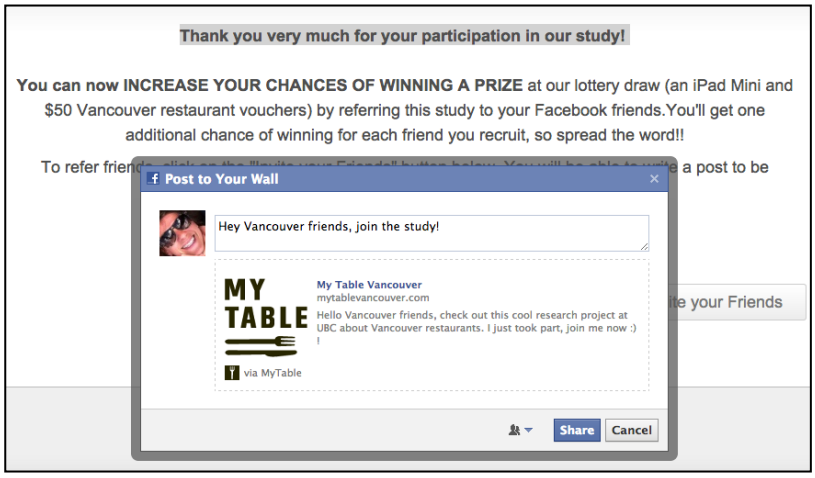
culture), @supervancouver (city guide covering events, dining, entertainment and wherever the action is!), @ediblevancouver (a print magazine about local food & drink.), @VIAwesome (about things that make Vancouver awesome).

process, which is illustrated in Figure A.4, was incentivized by providing extra lottery tickets valid for winning a prize at the study raffle.

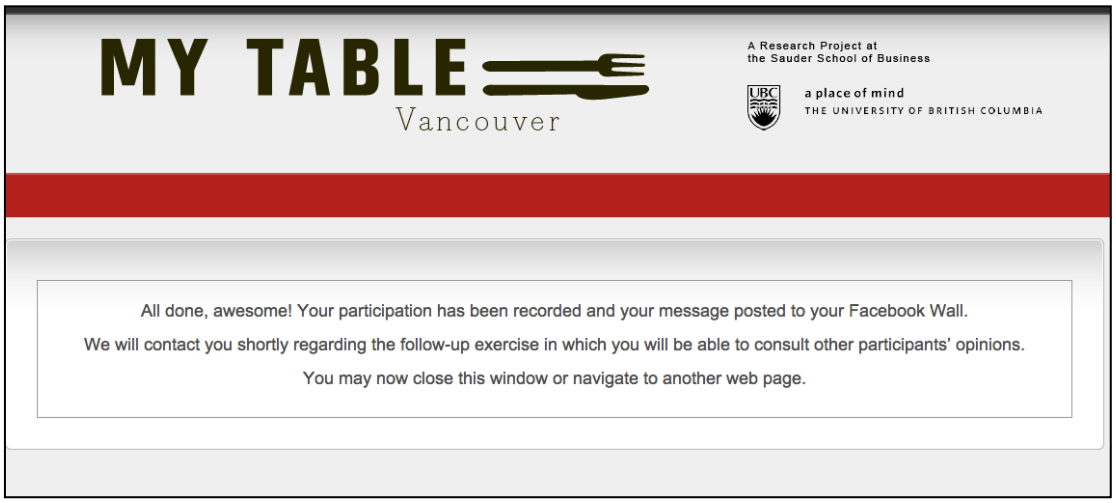
Figure A.4 Screenshots Illustrating the Active Referral Process (Preliminary Phase)



(1/4) This screen prompts participants to broadcast the study on Facebook



(2/4) The "Post to your wall" window appears when clicking on "Invite your Friends"



(3/4) This validation message appears after sharing the study on Facebook

(4/4) Example of how a referral message shows up on Facebook after the referral

Passive referral: After reaching an initial base of 100 participants, I created several Facebook 'Sponsored Ads' that targeted an audience restricted to the friends of those who already installed my App, that is, Facebook friends of those who had already logged in to my My Table website. Facebook 'Sponsored Stories' were also used to promote the study specifically to the friends of existing participants. Contrary to Ads, Stories are based on organic content from Facebook (e.g., when someone uses a Facebook App or likes a Facebook Page). They enable higher engagement rates than regular Ads because they are

based on friends' endorsement. I devised these additional passive referral strategies (via Sponsored Ads or Sponsored Stories, both illustrated in Figure A.5) in order to enhance the probability of two nodes being connected when a new node was added to the network. That is, to increase the average degree of the network and the size of the network's main component (i.e., the set of nodes which are all connected either directly or via others).

Figure A.5 Facebook Advertising Mechanisms Used to Leverage Passive Referral

Facebook sponsored ads targeting only friends of those who installed the app

Potential Audience for this ad: less than 1,000 people

Who live in Canada
Who live in Vancouver, BC
age 20 and older
Who are not already connected to My Table
Whose friends are already connected to My Table

Facebook sponsored stories: shown to friends of those who already installed the app

Potential Audience for this sponsored story: less than 1,000 people

Who live in Canada
Who live in Vancouver, BC
between the ages of 21 and 62 inclusive
Who are in the broad category Food & Dining
Who are not already connected to My Table friends of people who posted via the application My Table or friends of people who used via the application My Table

In sum, participants' recruitment procedure was designed in a way that enabled testing the theory because: (1) the wide population of interest (i.e., Facebook users with an interest in the domain being used as a context for my study) was targeted so that the resulting pool of participants would be heterogeneous enough to exhibit *variance* in the independent variable that I did not intend to manipulate (participants' SN size), (2) snowball sampling ("a method uniquely designed for sociological research because it allows for the sampling of natural interactional units" (Biernacki and Waldorf 1981) and Facebook targeted Ads and Sponsored

Stories enabled the creation of the underlying social network – in fact, testing the proposed theory would not be feasible without *interdependent* participants. Table A.1 summarizes key participation statistics for this preliminary phase. The fact that 90 (22%) of the network's members were recruited as a result of friends' endorsement (i.e., active referral) and that 110 (27%) enlisted after being prompted by one of my Ad on Facebook demonstrates the effectiveness of the recruitment strategies. The participants' demographics presented in Table A.2 also suggest that my procedures were effective in yielding a diversified group of individuals in terms of gender (62.9% females, 33.9% males), age groups (from 19 to 65, with a 28 years old average), and occupation (less than 50% were students). In addition, this table shows that the list of restaurants on the My Table site was relevant as participant' food and location preferences matched those covered in the list.

Table A.1 Website Visits, Study Participation and Referral (Preliminary Phase)

Metric	**Description (Source)**	**Value**
Website visits	Number of unique visits to my website's home page between February 22 and March 11 2013 (Google Analytics).	3,117 people
Total 'review' participants	The number of individuals who granted access to my App and completed the restaurant review task (My Table database (DB)).	404
Total 'complete' participants	The number of individuals who completed both the restaurant review and the survey (My Table DB).	386
Conservative response rate	Number of completes divided by number of unique views.	12.4%
Survey speeders	Number of individuals who answered the same for all survey questions (My Table DB).	8
Step 2 agreement opt-out	Participants who did not agree to be contacted again for part 2 of the study (My Table DB).	11
Social share	Proportion of participants who shared the study on their FB wall at the end of the study.	45%
Participants recruitment via natural referral	Number of participants that were recruited thanks to their friends' posting of the study on their wall (My Table DB).	90
Participants recruitment via Facebook advertising	The number of participants recruited via Facebook social ads (Facebook Ads Platform)	110

Table A.2 Participants Demographics

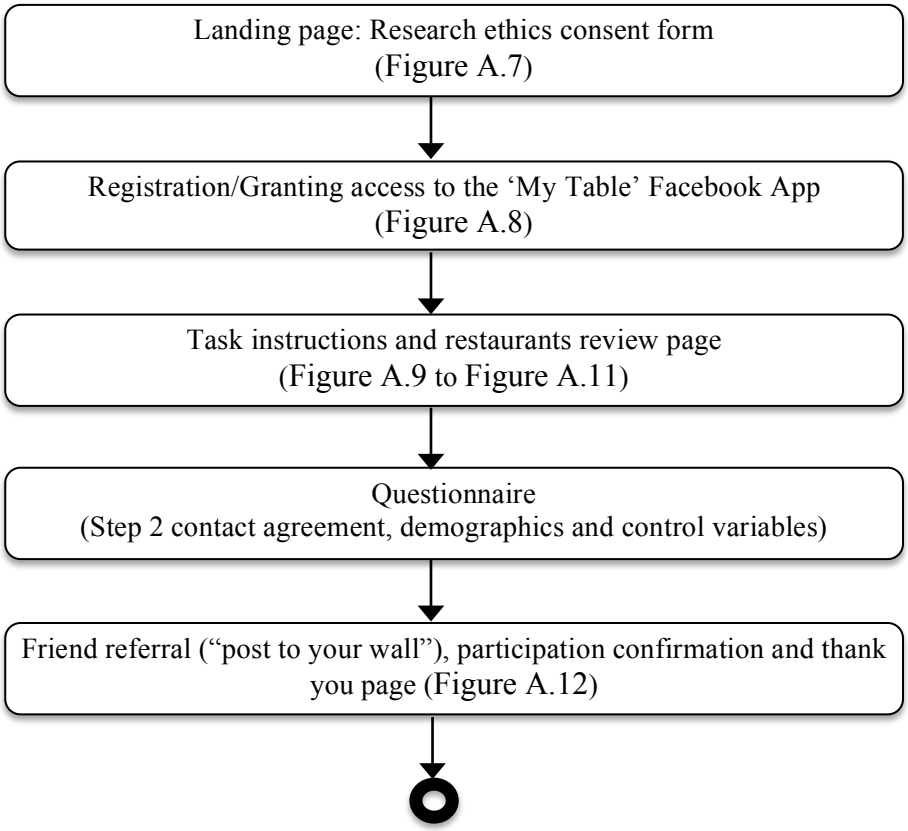
Metric	Description	Value
Gender* (categorical)	Female Male Missing	254 (62.9%) 137 (33.9%) 13 (3.2%)
Age (continuous)	Mean Min - Max Missing responses	28 19 - 65 27
Occupation (categorical)	Not a student Student Missing	208 (51.5%) 187 (46,3%) 9 (2.2%)
Eat out frequency (7-point scale)	Frequency of going out to the restaurant (from 1 never to 7 every day)	mean: 4.35 min: 1 (1 person), max: 7 missing responses: 17
Facebook friends	Participants' number of friends on Facebook	mean: 472 min: 0 max: 3256
Three most preferred food types	Number of times a food type was selected among three favourite food types	Japanese: 216 Canadian/West Coast: 79 Italian: 69
Five most frequent food types in the My Table site's listing		Canadian/West Coast: 52 (18.2%) Japanese: 36 (12.5%) Steak and Seafood: 36 (12.5%) Italian: 29 (10.1%) Pubs: 25 (8.7%)
Five most popular eat out neighborhoods	Number of times a neighborhood was selected as the one of the most frequented place to go dine out	Downtown: 235 Kitsilano: 161 Gastown: 92 UBC/Point Grey: 89 Fairview/Main St: 87
Comparison with restaurant locations in my product catalogue (287 restaurants in total in the catalogue)	Most frequent locations of the restaurants making up the My Table site's restaurants list	Downtown: 57 (19.9%) Kitsilano: 29 (10.1%) Gastown: 29 (10.1%) West-End: 26 (9.1%) Yaletown: 21 (7.3%) UBC/Point Grey: 19 (6.6%) Fairview/Main St: 17 (5.9%)
Home neighborhood	Where do my participants live? (those representing less than 2% of the participants are not shown)	UBC/Point Grey: 71 (17.6%) East Van: 64 (15.8%) Kitsilano/West side: 52 (12.9%) Fairview/Main St: 39 (9.9%) Burnaby: 39 (9.9%) Richmond: 23 (5.7%) West End: 16 (4%) Yaletown: 13 (3.2%) Kerrisdale/Shaughnessy: 13 (3.2%)

*Note on gender: The unbalance in gender distribution is in line with the common belief that shopping for fun or for a social purpose is considered more female-oriented while the efficiency-maximizing type of shopping is considered more male-oriented (Wang and Zhang 2012).

A.2 Preliminary Task: Restaurants Review

When individuals from the study's target population reached the website URL (e.g., by clicking on the Ads/Stories on Facebook or on friends' referral posts on Facebook), they landed on the first module website's home page, which presented the study. They were guided through a sequential process illustrated in Figure A.6

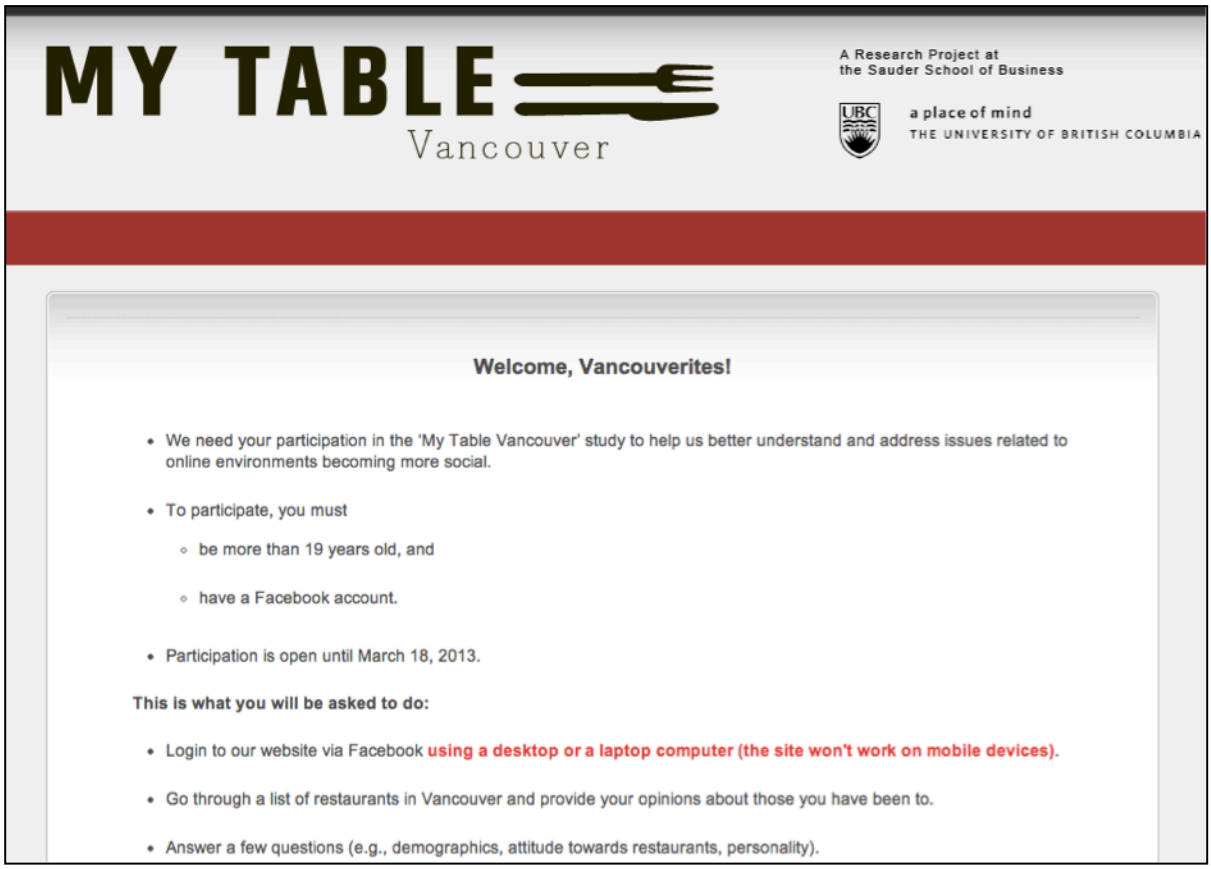
Figure A.6 Diagrammatic Flow of the Preliminary Phase



Landing page: On the website's landing page (see Figure A.7), participants could read the study and ethics related information. The consent form made it clear that some of their Facebook information would be accessed ("The App will receive from Facebook the following information: your name, email address, picture, gender, Facebook id, and list of your friends") and that their content contributions might be visible to others ("Together with

your opinions about Vancouver restaurants, your Facebook name and picture may be made visible to the other study participants during the follow-up exercise.”).

Figure A.7 Ethics Agreement



MY TABLE Vancouver

A Research Project at the Sauder School of Business

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Welcome, Vancouverites!

- We need your participation in the ‘My Table Vancouver’ study to help us better understand and address issues related to online environments becoming more social.
- To participate, you must
  - be more than 19 years old, and
  - have a Facebook account.
- Participation is open until March 18, 2013.

This is what you will be asked to do:

- Login to our website via Facebook **using a desktop or a laptop computer (the site won't work on mobile devices).**
- Go through a list of restaurants in Vancouver and provide your opinions about those you have been to.
- Answer a few questions (e.g., demographics, attitude towards restaurants, personality).

- In total, this should take between 10 and 15 minutes of your time.

This is how you will be compensated:

- You will enter a draw whose prizes include an **iPad Mini** and **$50 Vancouver restaurant vouchers**.
- You will be able to increase your chances of winning the draw by:
  - Referring this study to your Facebook friends (one additional chance of winning per recruited friend; for example, you will get 5 total chances if you recruit 4 friends)
  - Participating in a fun online follow-up exercise early March (doubling your total chances; that is, in the previous situation, you will get a total of 10 chances).

This is what you need to know regarding the protection of your personal information

- We will ask you to login to our website via Facebook, that is, to authorize our Facebook App ('MyTable') to connect to your Facebook account.
- The app will receive from Facebook the following information: your name, email address, picture, gender, Facebook id, and list of your friends.
- Together with your opinions about Vancouver restaurants, your Facebook name and picture may be made visible to the other study participants during the follow-up exercise which will take place in March. That is, others might see "Your name" likes "name of a restaurant".
- No data will be sent to your Facebook timeline or disclosed to other entities.
- The study data (i.e., opinions about restaurants, answers to survey questions, usage logs, Facebook data) will be collected for the sole purpose of this research project. It will be saved on password protected computers located in a locked-secured place at UBC.
- This project may form part of a doctoral dissertation. It will be a public document upon submission to UBC library. The data will only be accessed by the Primary Investigator and Co-Investigator, and published reports will not contain information that identifies you individually by any means.

Contact for information about the study

Principal Investigator:
Dr. Izak Benbasat, Professor
Sauder School of Business
MIS Division
Email: izak.benbasat@sauder.ubc.ca

Co-Investigator(s):
Camille Grange, PhD student
Sauder School of Business
MIS Division
Email: camille.grange@sauder.ubc.ca

Contact for concerns about the rights of research subjects

If you have any concerns about your treatment or rights as a participant, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604- 822-8598.

Consent

Your participation in this study is strictly voluntary and you may refuse to participate or withdraw from the study at any stage by simply closing your browser or using Facebook privacy settings to remove the My Table App.

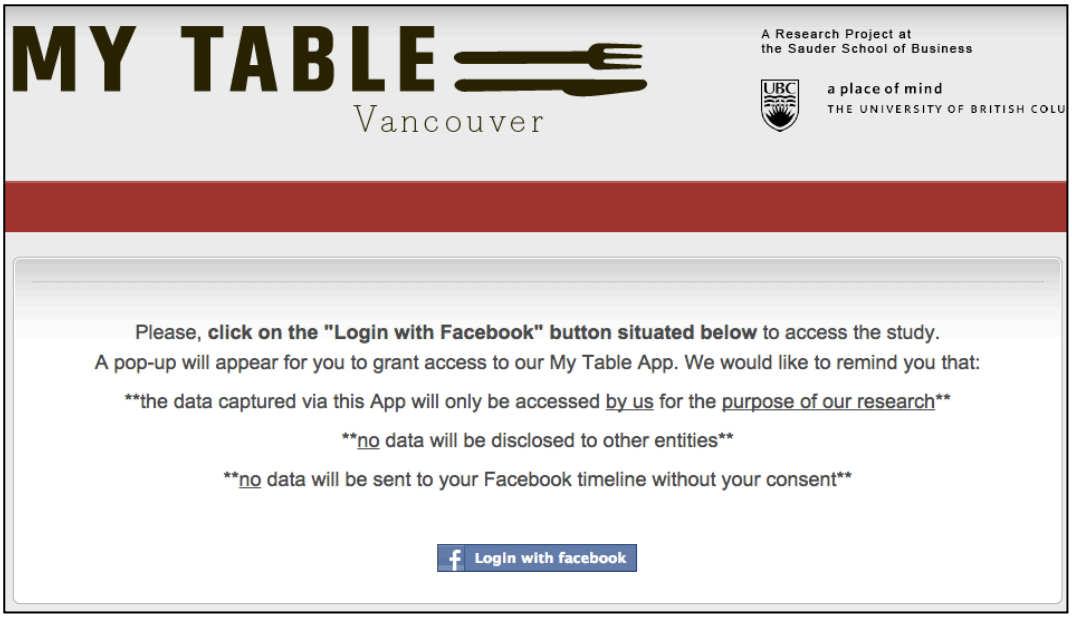
If you agree to participate, you indicate that you have read and understood this form and you confirm that you are at least 19 years of age.

My email address is: [ ]

Next >> | I Disagree

Facebook Log in: After agreeing to the study's ethical guidelines, participants were asked to sign-up to the website using the Facebook Connect tool (see Figure A.8). In the process, they were notified once again about the information that the My Table App would access (Facebook ID, email, first name, list of friends' IDs).

Figure A.8 Granting Access to the 'My Table' Facebook App (Preliminary Task)



Reviewing restaurants: After logging in with Facebook to the My Table site, participants were redirected to the restaurants review page, where detailed instructions were provided (see Figure A.9). The 287 restaurants were grouped in 14 Vancouver neighborhoods and listed on one page. Since this restaurants review page was fairly long (i.e., it required substantial scrolling to reach the end of the list), within-page links were added for users to quickly access relevant neighborhoods that might be situated far down the page, thereby reducing fatigue and boredom (See Figure A.10). To avoid the risk of getting systematic lower quality data about restaurants situated down on the page (especially for those users who would not use the within-page links), the order via which the 14 neighborhoods were displayed on the page was dynamically randomized for each user. Within each neighborhood, restaurants remained listed by alphabetical order.

The task consisted in navigating the page in order to identify the restaurants they had visited in the past ("click here if you've been!" button – Figure A.11). For these restaurants, they could select tags to convey their opinions, provide a rating (using a 6-point scale with the following anchors: mediocre, OK, good, great, outstanding), write a short comment (maximum 100 characters), and recommend it. Figure A.11 shows how the restaurant assessment unfolded via the interactive widget implemented on the site.

Figure A.9 Screenshot of Task Instructions (Preliminary Task)

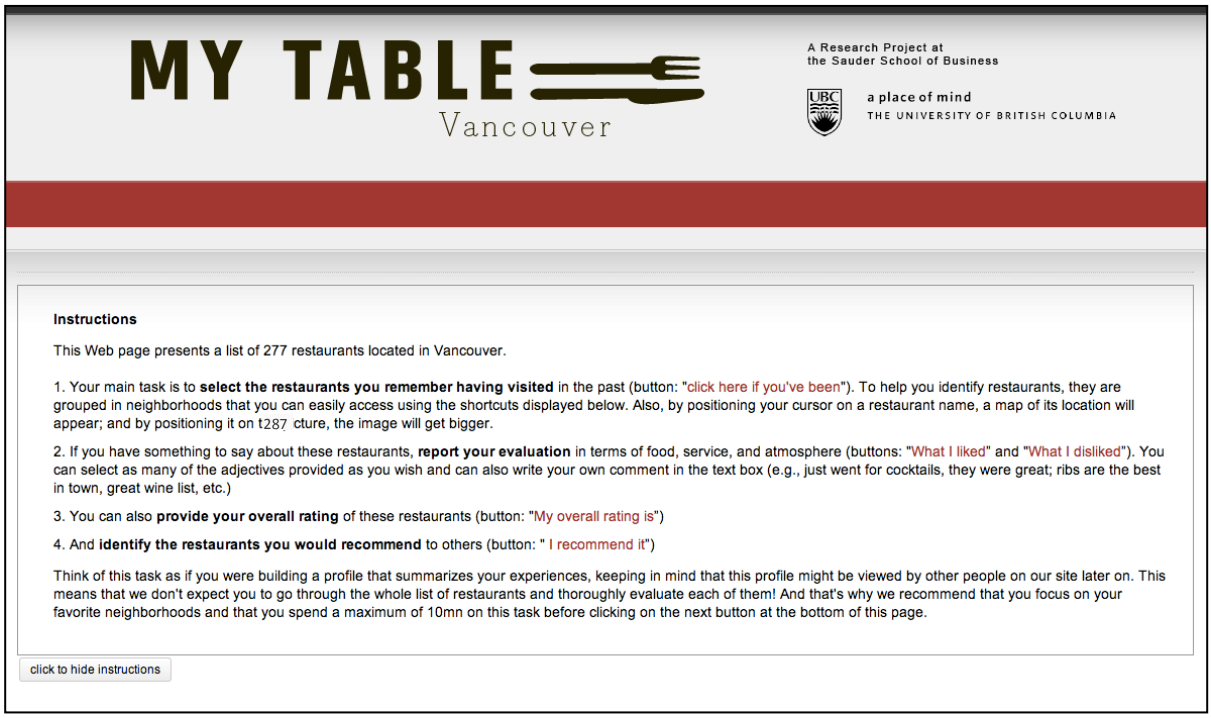


Figure A.10 Screenshot of the Restaurants Review Page

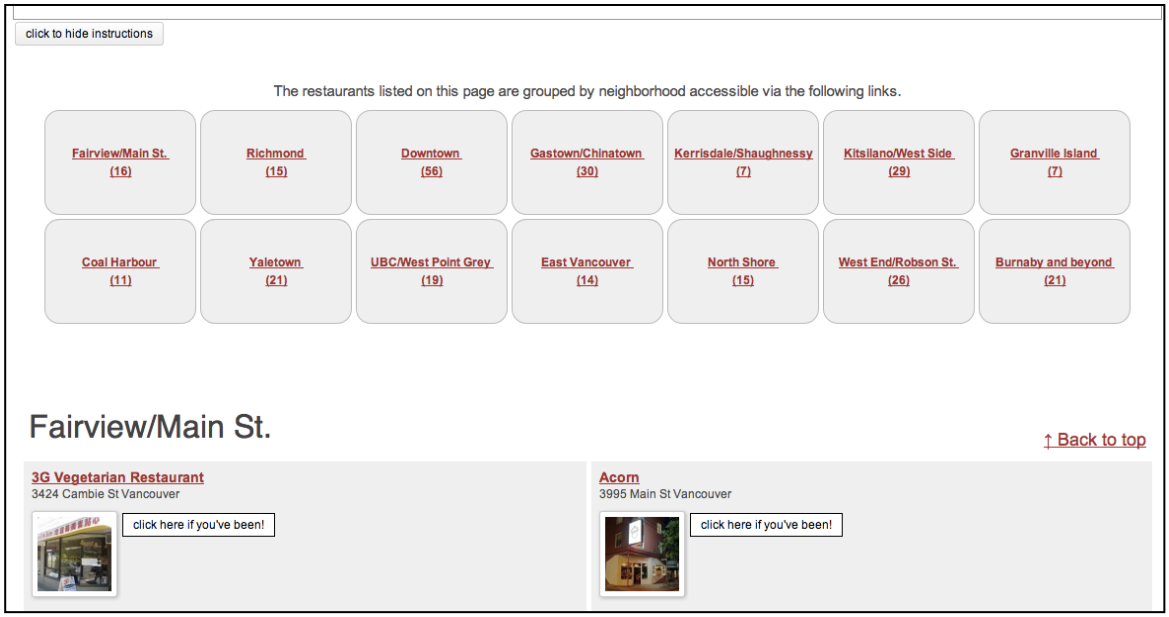
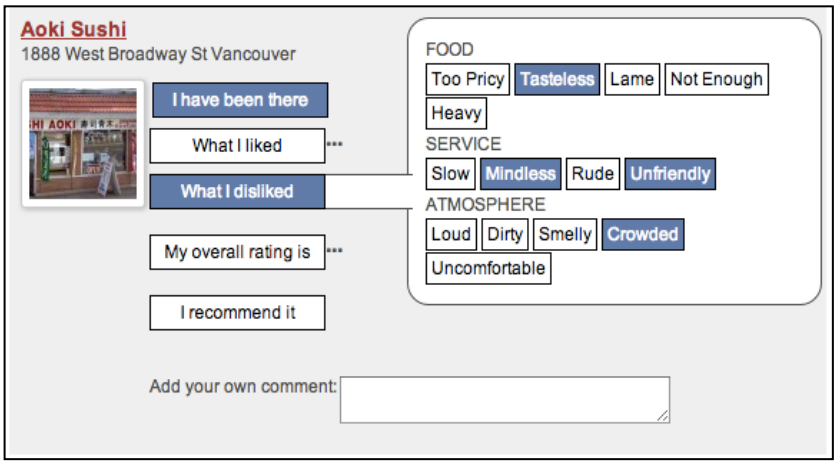


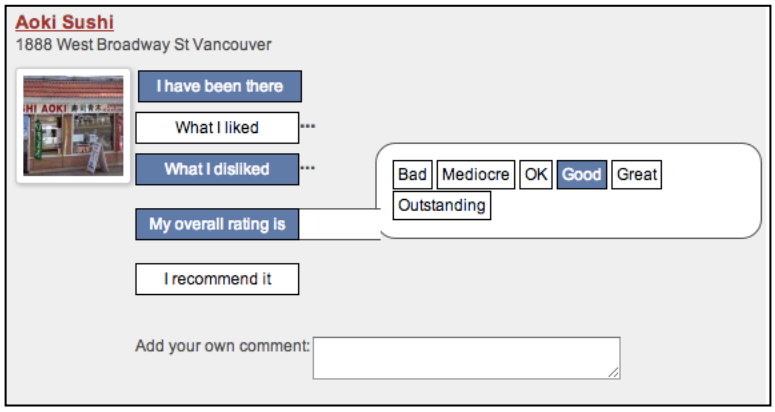
Figure A.11 Screenshots of Restaurants Review Widget

(1/5) Users could indicate which restaurants they had visited in the past

(2/5) Users could specify what aspects of a restaurant they liked



(3/5) Users could specify what aspects of a restaurant they disliked

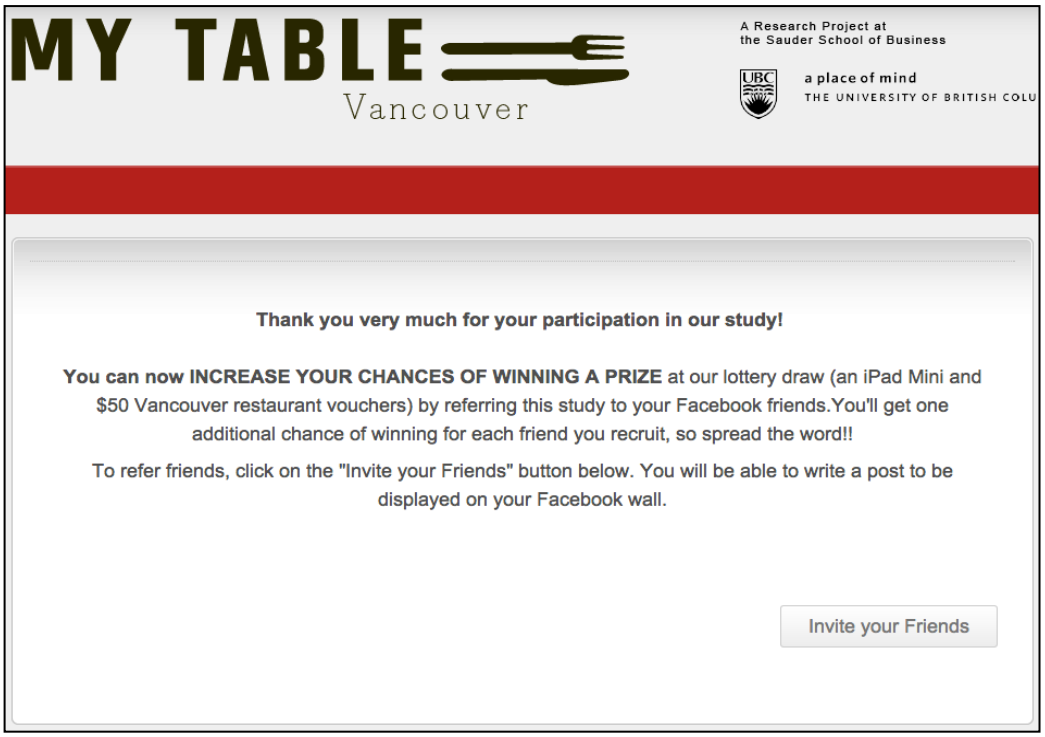


(4/5) Users could rate restaurants

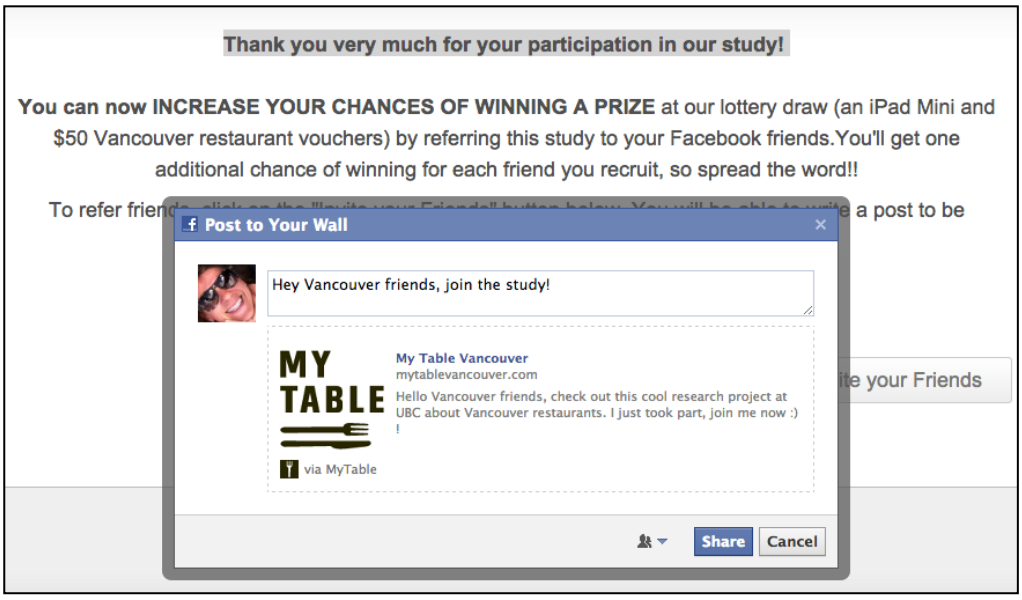
(5/5) Users could recommend restaurants and write a comment about it

Post-task questionnaire: When clicking on 'Next' at the bottom of the restaurants review page, participants were taken to a survey that asked whether they would be willing to be contacted again for follow-up exercise (i.e., participate in the study's experimental phase), inquired about their demographics and food and neighborhood preference, and measured a few additional control variables (e.g., frequency of eating out). After completing the survey, participants were prompted to share the study with their friends on Facebook, a procedure illustrated in Figure A.12.

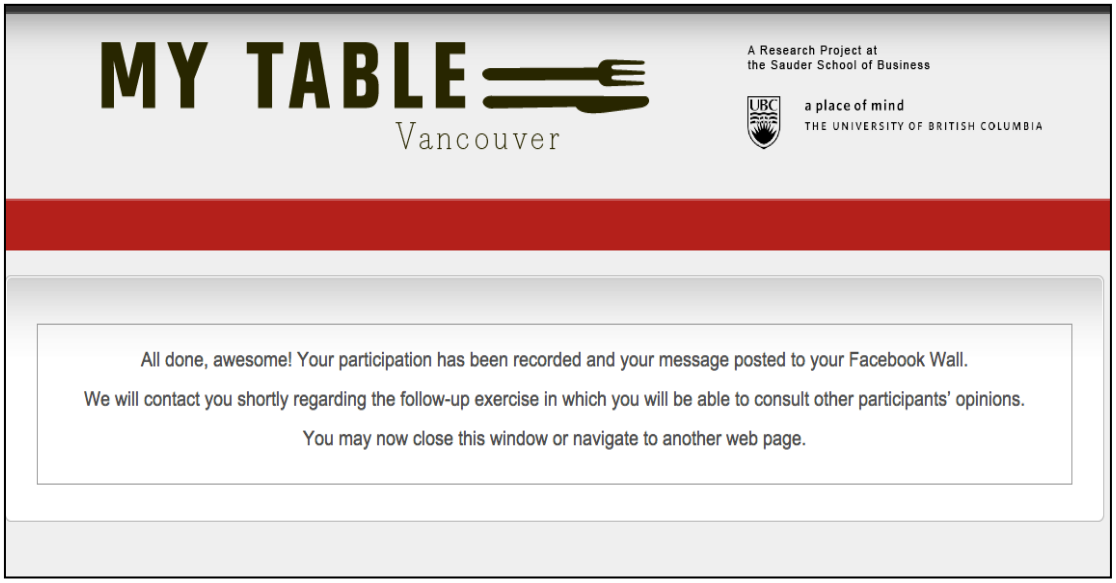
Figure A.12 Screenshots Illustrating the Active Referral Process



(1/3) Screen shown to prompt participants to broadcast the study on Facebook



(2/3) The "Post to your wall" window appears when clicking on "Invite your Friends"



(3/3) Validation message after sharing the study on Facebook

A.3 The Resulting 'My Table' Social Network

This preliminary phase yielded a social network composed of 404 individuals who were friends, on average, with 3.5 other users. The network, illustrated via a social graph in Figure A.13, had one large main component (i.e., the subset of the network that is fully connected) made of 314 people. This main component had a diameter of 13 and its average geodesic distance (i.e., the average distance it would take for a user to connect to a randomly chosen other) was 5.4, in the range of other digital networks (Backstrom et al. 2012; Dodds et al. 2003) that are often qualified as *small world* networks (Milgram 1967), i.e., via which it is possible to reach all others via a relative small number of intermediaries. Another indicator of small world property is the clustering coefficient (i.e., the number of connections between a user's neighbors divided by the max number of connections between them). The average value in my social network was .37, indicating unsurprisingly that it was composed of denser local structures than those typically found in random graphs for which this coefficients is typically in the 10^{-2} or 10^{-3} range (Watts and Strogatz 1998). The network also exhibited signs of preferential attachment as it was composed of a few very well connected nodes (e.g., 6 My Table users had more than 15 friends) and of many others with low degree (e.g., 90 My Table users had one friend, 74 two friends, 44 three friends). Such networks, often characterized as scale-free networks, are common occurrence in the offline and online worlds (Barabási and Albert 1999). Additional descriptive metrics are provided in Table A.3.

Figure A.13 Graph of the 'My Table' Social Network

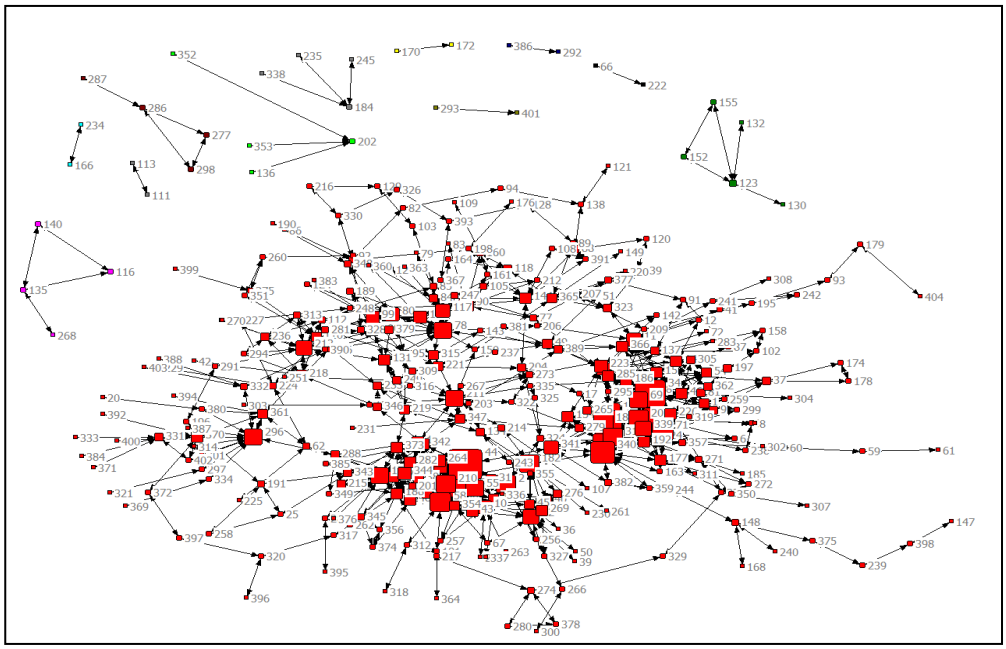


Table A.3 Network Level Metrics for Social Relations on the 'My Table' Website

Metric	Explanation (source)	Value
Network density	The degree to which My Table users are connected to each other in the network's main component (UCINET*)	1.%
Network degree	The number of friends that My Table users (in the network's main component) are connected to (UCINET).	Avg: 4.3 min: 0 max: 25 std. dev: 3.8
Average geodesic distance	The average distance (shortest path) between each My Table user and all other users (in the main component).	5.4
Diameter	The longest path (i.e., number of steps) between two users in My Table network's main component (UCINET).	13
Degree distribution	The distribution of social network sizes among My Table users (UCINET).	0: 57 (isolates) 1: 90 (pendants) 2: 74 3: 44 4: 30 … >10: 24 >15: 6
Clustering coefficient	The sample average of the number of connections between a My Table user's neighbours divided by the maximum number of connections between them.	0.37

* UCINET is a social network analysis software (Borgatti 2010)

A.4 The Resulting Shopper-by-Product 'My Table' Network

Overall, more than 30,000 tags, 3,000 recommendations, 5,000 ratings, and 750 open comments were generated on My Table. Statistics are detailed in Table A.4 (participant-focused statistics) and Table A.5 (restaurant-focused statistics).

Table A.4 Descriptive Statistics (Participant-Focused)

	went to	liked	liked_v	disliked	disliked_v	fav	rated	rating_v	text	total UGC
Avg	19.1	14	65	8	16.2	7.58	15	4	1.9	99
Min	0*	0	0	0	0	0	0	2	0	0
Max	112	57	440	47	119	52	81	6	35	479
Median	14	11	45	6	11	5	12	4	0	58
Std dev.	16.6	11.8	68.1	7	17.7	7.74	13.4	1.1	4.4	81.7
Total #	**-**	**-**	**26,300**	**-**	**6,530**	**3,063**	**5,543**	**-**	**766**	**-**

liked: The number of restaurants for which users selected at least one like tag
liked_v: The number of like tags that participants selected in their review
disliked: The number of restaurants for which users selected at least one dislike tag
disliked_v: The number of dislike tags that participants selected in their review
fav: The number of restaurants that users selected as their 'favorite'
rated: The number of restaurants that users rated
rating_v: The average rating provided by users who rated restaurants
text: The number of users who have left at least one comment
total UGC: The number of tags (liked and disliked) plus free-text contributions by users
* 7 users did not go to any of the 287 restaurants.

Table A.5 Descriptive Statistics (Restaurant-Focused)

Metric	Description	Value
Total went to	Number of restaurants that were visited by at least one user (note: there are 287 restaurants in total)	283
Total liked tagged	Number of restaurants that were assigned at least one What I liked tag by users	281
Total disliked tagged	Number of restaurants that were assigned at least one What I disliked tag by users	273
Total 'faved'	Number of restaurants that at least one user chose as favorite	266
Total 'rated	Number of restaurants that at least one user rated	281
UGC-Restaurants that received comments	Number of restaurants that have at least one open text comment	222
UGC – Users who used free text	Number of users who have left at least one comment using the free text box	162

* Note that a few (10) comments were removed because they were not notes about the experience visiting the restaurant (e.g., "I have never been but good comments"; "I won't eat there, These guys are gentrifiers").

Appendix B Contact E-Mail (Papers #2 and #3)

The new MyTable Vancouver website is now live! Participate in the second segment of this UBC study about Vancouver restaurants.

Is this email not displaying correctly? View it in your browser.

MY TABLE Vancouver

A Research Project at the Sauder School of Business - MIS Division

a place of mind THE UNIVERSITY OF BRITISH COLUMBIA

Dear << Test First Name >>,

A few weeks ago, you used the **MyTable Vancouver website** to review some restaurants, as part of a research project we are conducting at the University of British Columbia.

We woud like to **thank you** for your participation and to **invite you** to proceed to the **follow-up exercise.**

In this new segment, you will **browse the NEW MyTable website** to find restaurants you would like to try out. A final one-page survey with questions on your experience using the website will conclude the exercise.

To take part, click here!

A few important **reminders**:
--You can only use a laptop or desktop to access the website (i.e., you cannot access the website on tablet and/or mobile devices)
--The website is not functional when using Internet Explorer version 7 or older.
--By participating in this exercise, you double your current chances to win in the raffle (prizes include iPad Mini and $50 restaurant vouchers)

Thank you for participating and helping with this research study!

Camille Grange
Research co-investigator, Project http://mytablevancouver.com
Sauder School of Business, The University of British Columbia
Vancouver, Canada.

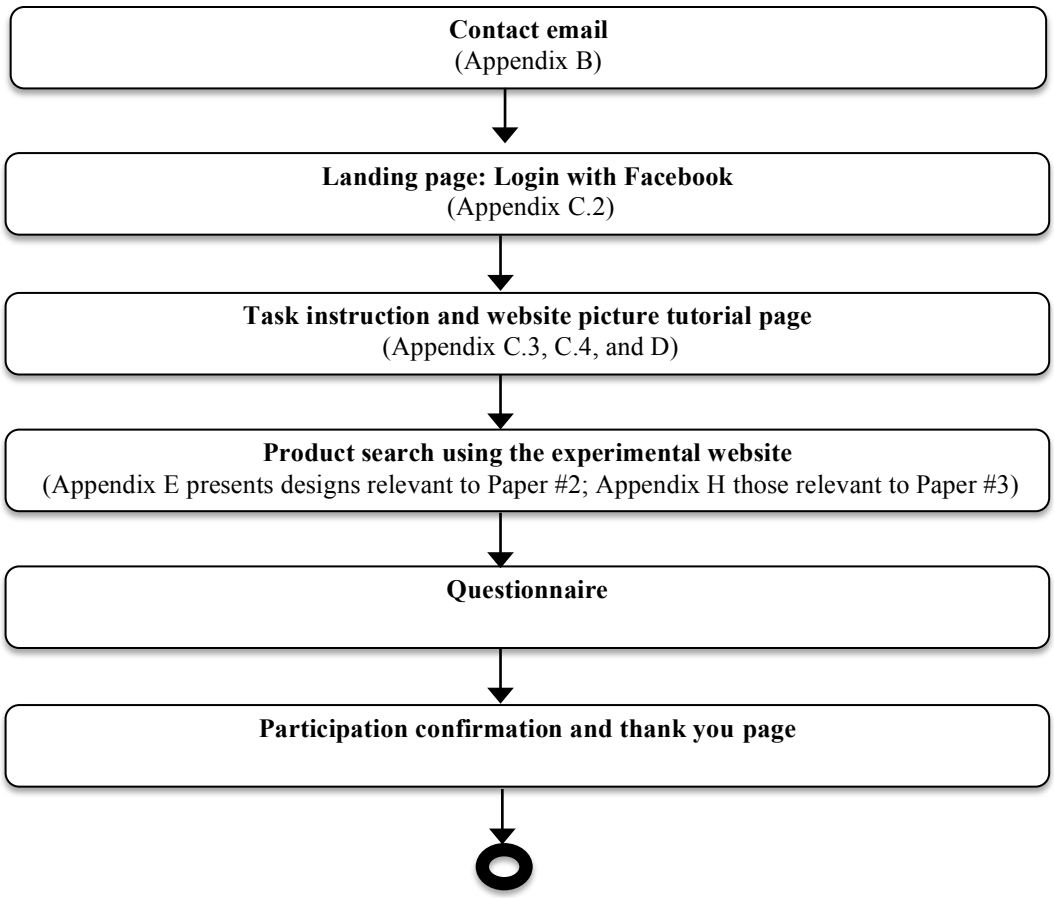
You are receiving this email because you participated in the first part of a two-part online study (named MyTable Vancouver) in March 2013 and agreed to be contacted again for the second and last part of the study. This study is conducted at the University of British Columbia. It was reviewed by and received approval from the Behavioural Research Ethics Board.
Our mailing address is:
The University of British Columbia, Vancouver
Sauder School of Business
2053 Main Mall
Vancouver, BC BC V6T 1Z2
Canada

MailChimp

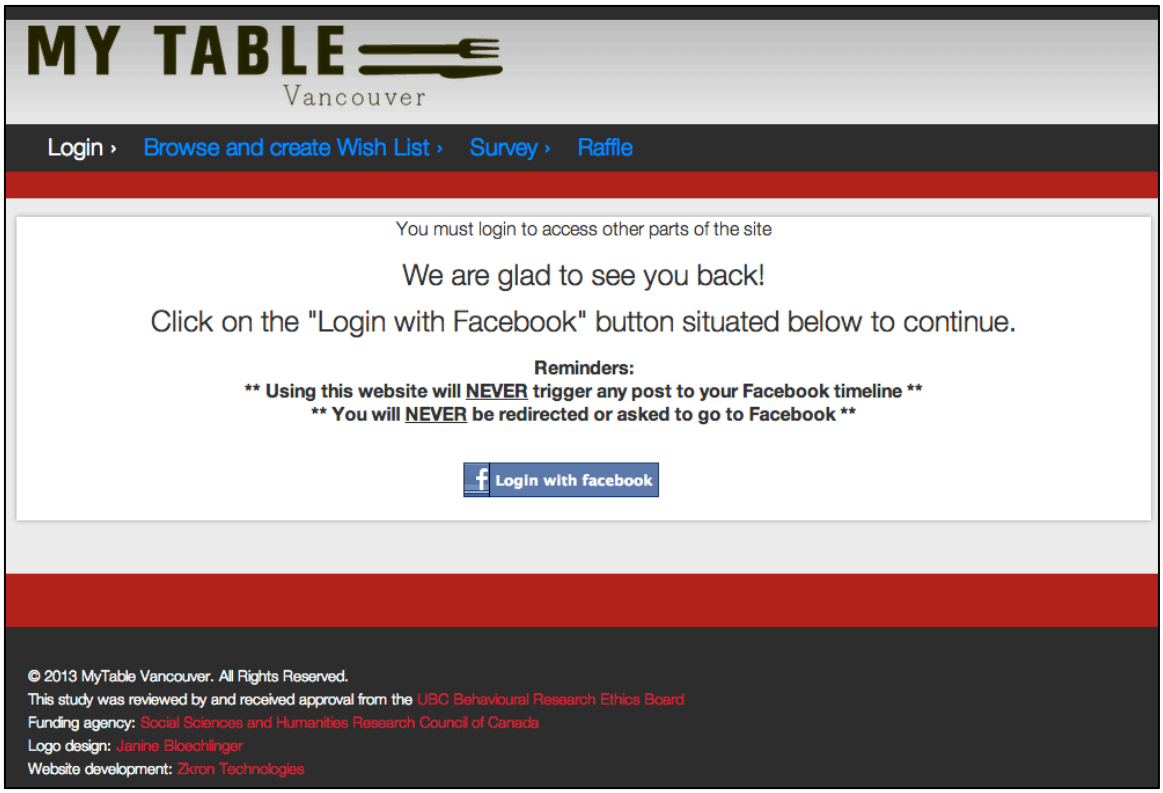
Appendix C Pre-Task Process and Screenshots (Papers #2 and #3)

Participants in the experimental phase were guided through a sequential process presented in Appendix C.1. Appendix C.2 illustrates the landing page and Appendices C.3 and C.4 are views of the task description pages (part I, and part II, respectively). Part II appeared only after subjects clicked on the "click here to save your list" button in Part I.

C.1 Diagrammatic Flow of the Experimental Phase



C.2 Landing Page



C.3 Task Instructions – Part I

Welcome back Joe!

PLEASE READ CAREFULLY

A short introductory tale about restaurants…
Finding nice places to go dine-out with colleagues, friends, or family, is not an easy task. Especially in a city like Vancouver where there are so many of them! In fact, tastes vary, some restaurants close, new ones open, and the quality of food and service at one restaurant can change over time.

In order to facilitate restaurant choices, we often rely on what we hear, read, or see in the street when passing by. We may also visit the same restaurant over and over again when we like it so much - and it makes the choice easier :). But, sadly, we often miss places that we would have liked because we are not aware of or lack information about them.

Preliminary step
You may have a kind of mental wish list of restaurants in Vancouver that you have never been to but had wanted to try for a long time. Please take a minute to think about it and write down the names of these restaurants in the space below (no minimum required, maximum 10 of them).

Click here to save your list

C.4 Task Instructions – Part II

Welcome back Joe!

PLEASE READ CAREFULLY

A short introductory tale about restaurants…
Finding nice places to go dine-out with colleagues, friends, or family, is not an easy task. Especially in a city like Vancouver where there are so many of them! In fact, tastes vary, some restaurants close, new ones open, and the quality of food and service at one restaurant can change over time.

In order to facilitate restaurant choices, we often rely on what we hear, read, or see in the street when passing by. We may also visit the same restaurant over and over again when we like it so much - and it makes the choice easier :). But, sadly, we often miss places that we would have liked because we are not aware of or lack information about them.

Preliminary step
You may have a kind of mental wish list of restaurants in Vancouver that you have never been to but had wanted to try for a long time. Please take a minute to think about it and write down the names of these restaurants in the space below (no minimum required, maximum 10 of them).

Burgoo, La Quercia, Point Grill, Mahony's

What's next?
We would like that you make use of the MyTable website and its content (e.g., restaurant reviews – that you can access in both restaurants and other shoppers' profile pages) to look for three additional restaurants that you NEVER visited before and are NOT in the mental wish list you created above (that is, restaurants for which you have less or no pre-determined knowledge or preference).

The first $50 restaurant voucher you may win in the raffle will be redeemable at a restaurant of your choice in your mental wish list (if this list was left empty, the restaurant will be picked among the ones you selected using the site). Additional $50 restaurant vouchers that you may win will be redeemable at places of your choice in the wish list that you are going to create using the site.

Feel free to explore and use any feature of the website and take as much time as you wish! Note that if you inadvertently close your browser window, you will be able to log in again on the site and navigate from where you were when you left.

This task and the following one-page survey should take about 15 minutes of your time. Your participation will be validated once you submit your answers to the survey. Good luck !! :)

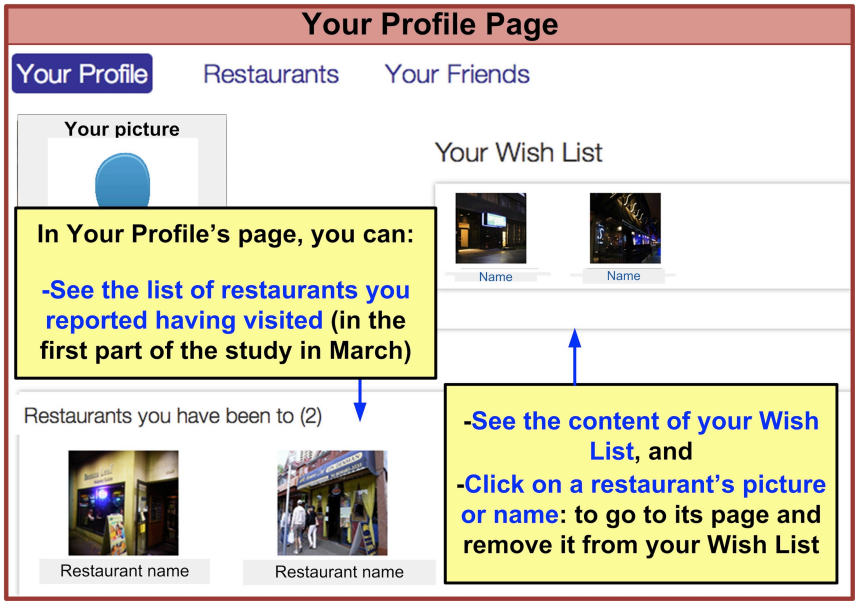
Before you start…
Please click on each link listed below to get to know the site's key features. It is very important that you understand how the site functions, so please consult the pictures carefully!

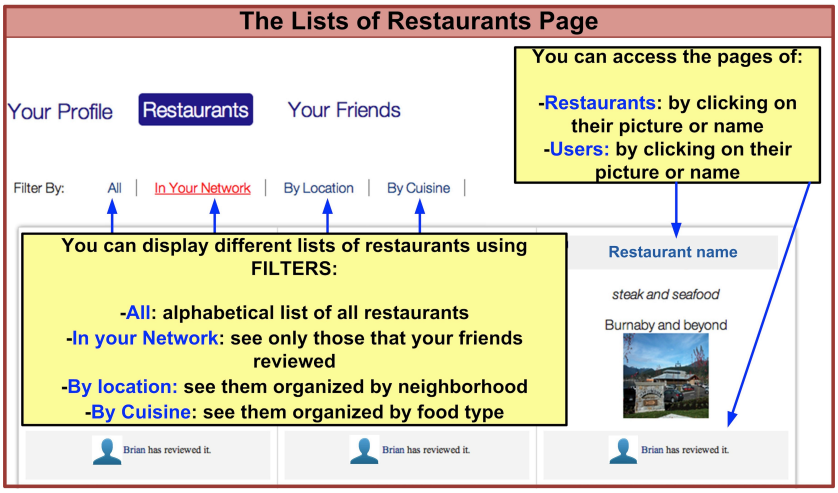
Your profile's page
The lists of restaurants
The restaurant pages
The user pages

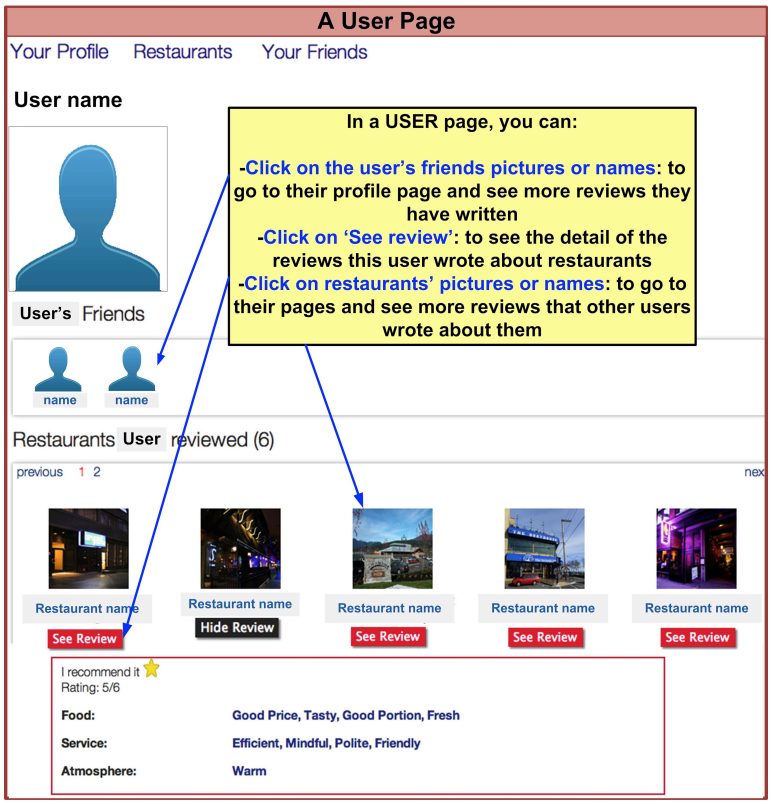
I understand my task and would like to proceed to the website.

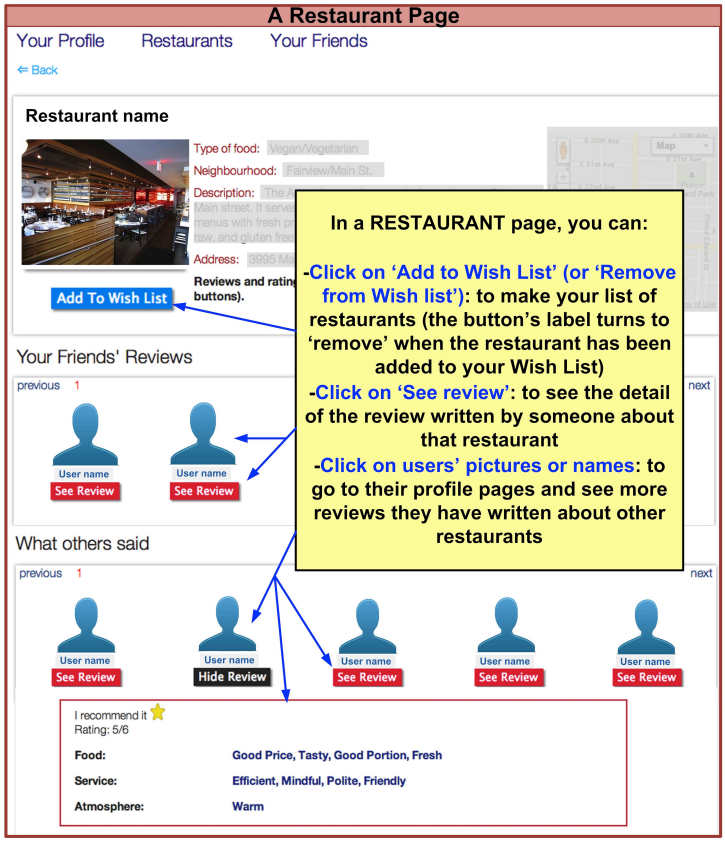
Appendix D Website's Tutorial Screenshots (Papers #2 and #3)

A commented picture of each type of page appeared when participants clicked on the tutorial links (shown above in Appendix C.4). The participants had to display each link to activate the "I understand my task and would like to proceed to the website" button. Key functionalities were described, as the screenshots in this Appendix show.






A User Page
Your Profile
Restaurants
Your Friends
User name
In a USER page, you can:
-Click on the user's friends pictures or names: to go to their profile page and see more reviews they have written
-Click on 'See review': to see the detail of the reviews this user wrote about restaurants
-Click on restaurants' pictures or names: to go to their pages and see more reviews that other users wrote about them
User's Friends
name
name
Restaurants User reviewed (6)
previous 1 2
next
Restaurant name
See Review
Restaurant name
Hide Review
Restaurant name
See Review
Restaurant name
See Review
Restaurant name
See Review
I recommend it
Rating: 5/6
Food:
Good Price, Tasty, Good Portion, Fresh
Service:
Efficient, Mindful, Polite, Friendly
Atmosphere:
Warm


A Restaurant Page
Your Profile
Restaurants
Your Friends
Back
Restaurant name
Type of food:
Neighbourhood:
Description:
Address:
Add To Wish List
In a RESTAURANT page, you can:
-Click on 'Add to Wish List' (or 'Remove from Wish list'): to make your list of restaurants (the button's label turns to 'remove' when the restaurant has been added to your Wish List)
-Click on 'See review': to see the detail of the review written by someone about that restaurant
-Click on users' pictures or names: to go to their profile pages and see more reviews they have written about other restaurants
Your Friends' Reviews
previous 1
next
User name
See Review
User name
See Review
What others said
previous 1
next
User name
See Review
User name
Hide Review
User name
See Review
User name
See Review
User name
See Review
I recommend it
Rating: 5/6
Food:
Good Price, Tasty, Good Portion, Fresh
Service:
Efficient, Mindful, Polite, Friendly
Atmosphere:
Warm

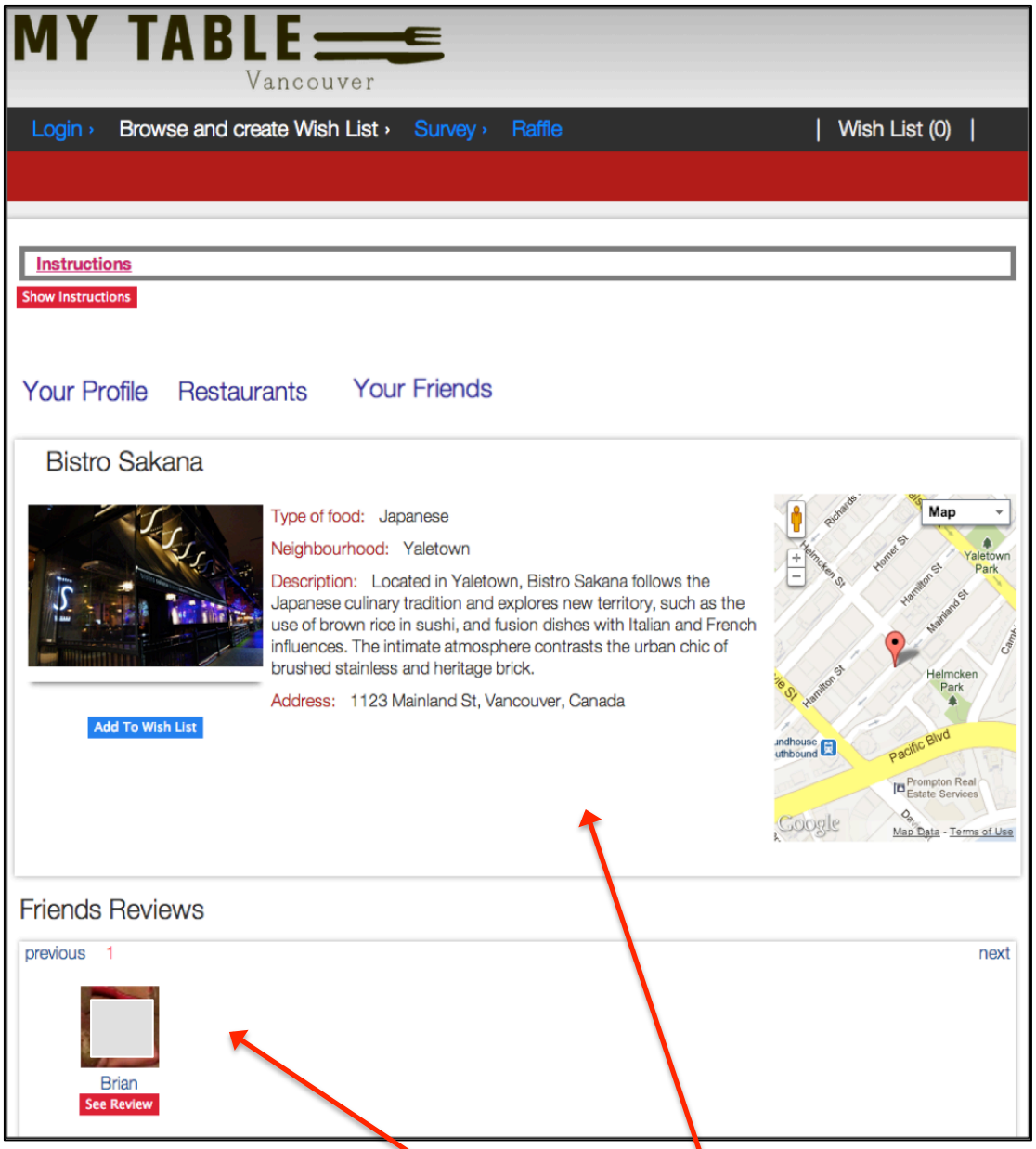
Appendix E 'My Table' Features Across the Three Conditions (Paper #2)

Table E.1 synthesizes the key elements included in the three experimental designs, as well as references to figures that illustrate these elements.

Table E.1 Design Elements Across Experimental Groups

Design Elements	**Experimental Groups**			
	Non SN-enabled	Private network	Open network	Illustrated in
Generic elements				
Presence of restaurant's *general information* (type of food, neighbourhood, brief description, address, map, picture of store front)	x	x	x	Figure E.1
Presence of a *product attributes filtering* mechanism ("by location" and "by cuisine" filters)	x	x	x	Figure E.2 Figure E.3
Elements manipulated across experimental groups				
Presence of a *product social filtering* mechanism ("in your network" *social feed*)		x	x	Figure E.4
Visibility of *personal* social connections ("Your friends" menu item)		x	x	Figure E.5
Visibility of *all* social connections ("X's friends" in X's profile page)			x	Figure E.6
Visibility of UGC (i.e., reviews) created by social connections ("friends' reviews" section in rest page)		x	x	Figure E.7
Presence of all UGC ("what others said" section in rest page)	x		x	Figure E.7

Figure E.1 A Restaurant Page in a SN-Enabled Design

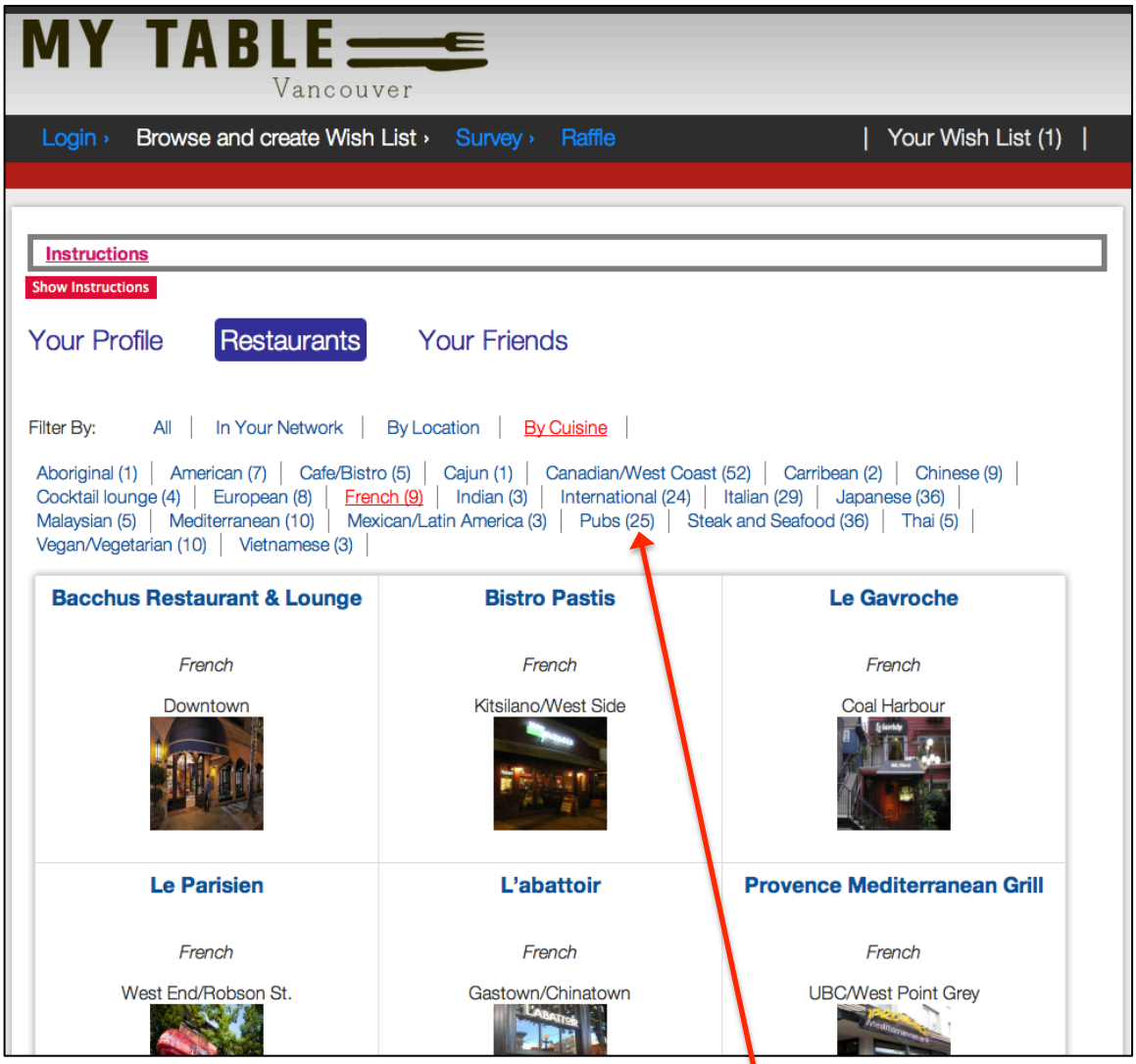


Friends' reviews section

See the reviews my friends have created

General (i.e., not user-generated) information about restaurants

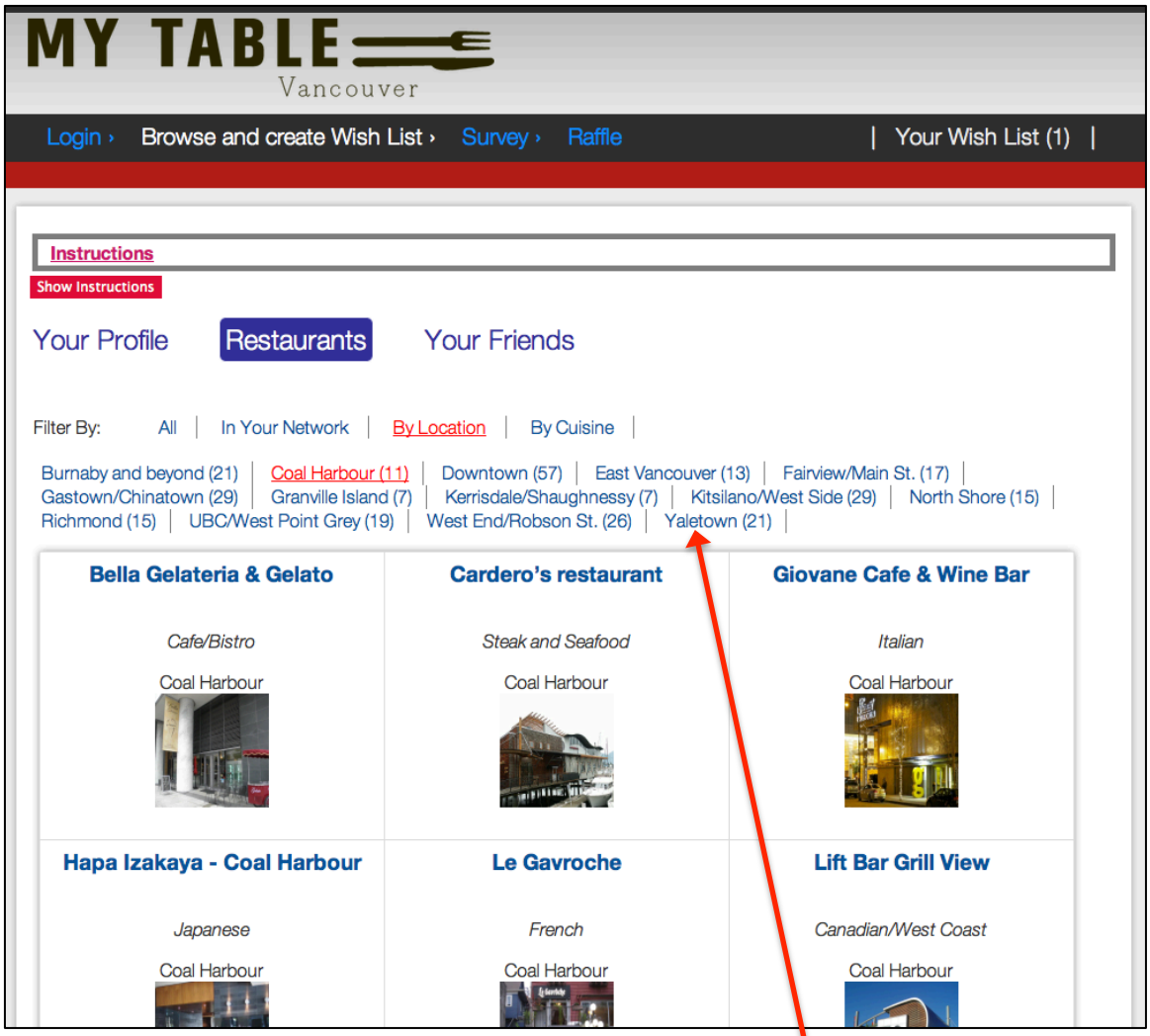
Figure E.2 The Cuisine Filtering Tool



By cuisine filtering tool

Click on 'by cuisine' and the list of food types appears. Clicking on one of these displays the filtered restaurant list below.

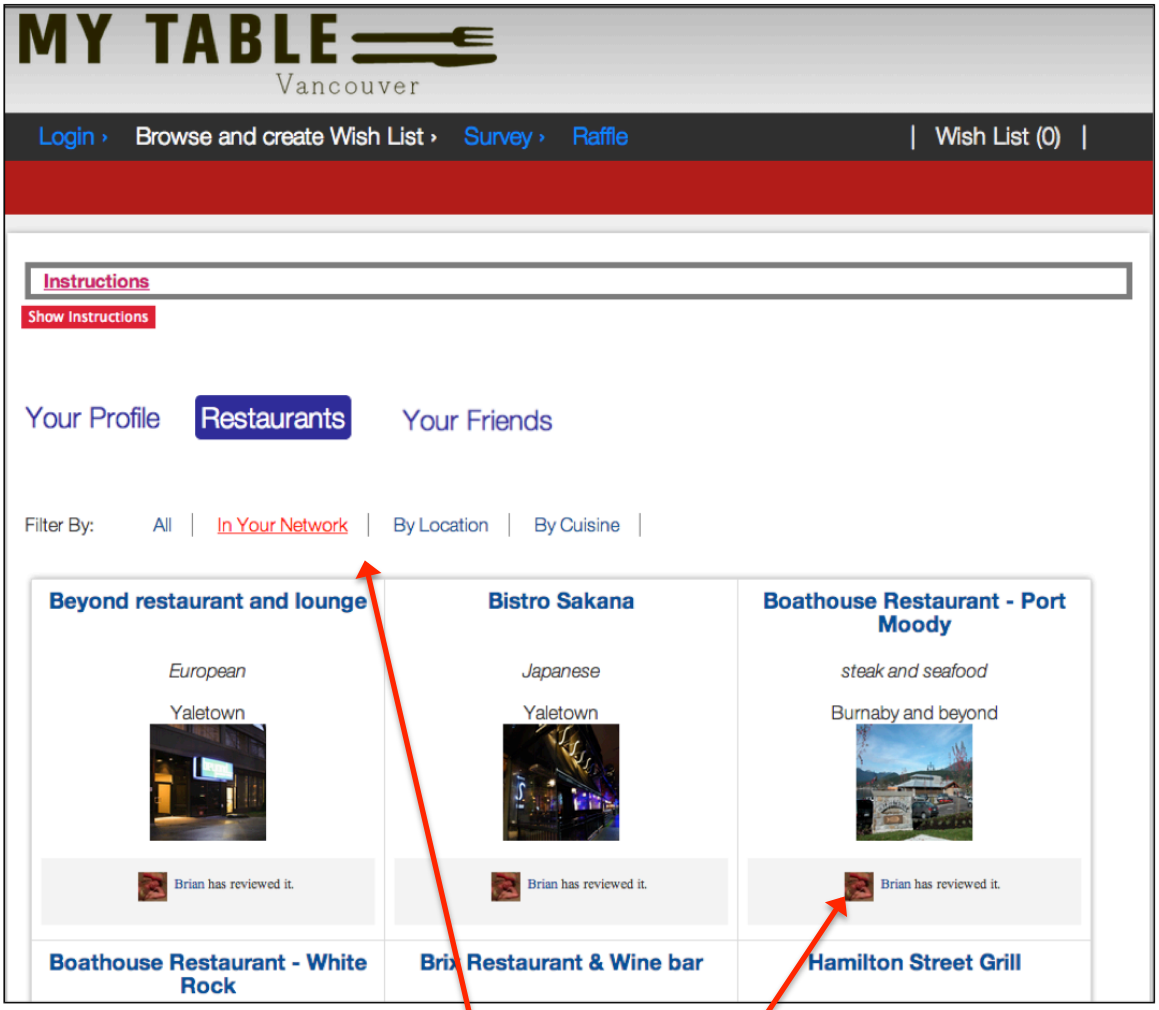
Figure E.3 The Location Filtering Tool



By location filtering tool

Click on 'by location' and the list of City's neighborhoods appears. Clicking on one of these displays the filtered restaurant list below.

Figure E.4 The Social Filtering Tool



In your network social feed

Click on 'In your network' and the list of restaurants that your friends have reviewed appears, with clickable picture(s) of who reviewed it.

Figure E.5 Visibility of Social Connections: the "My Friends" Menu Item

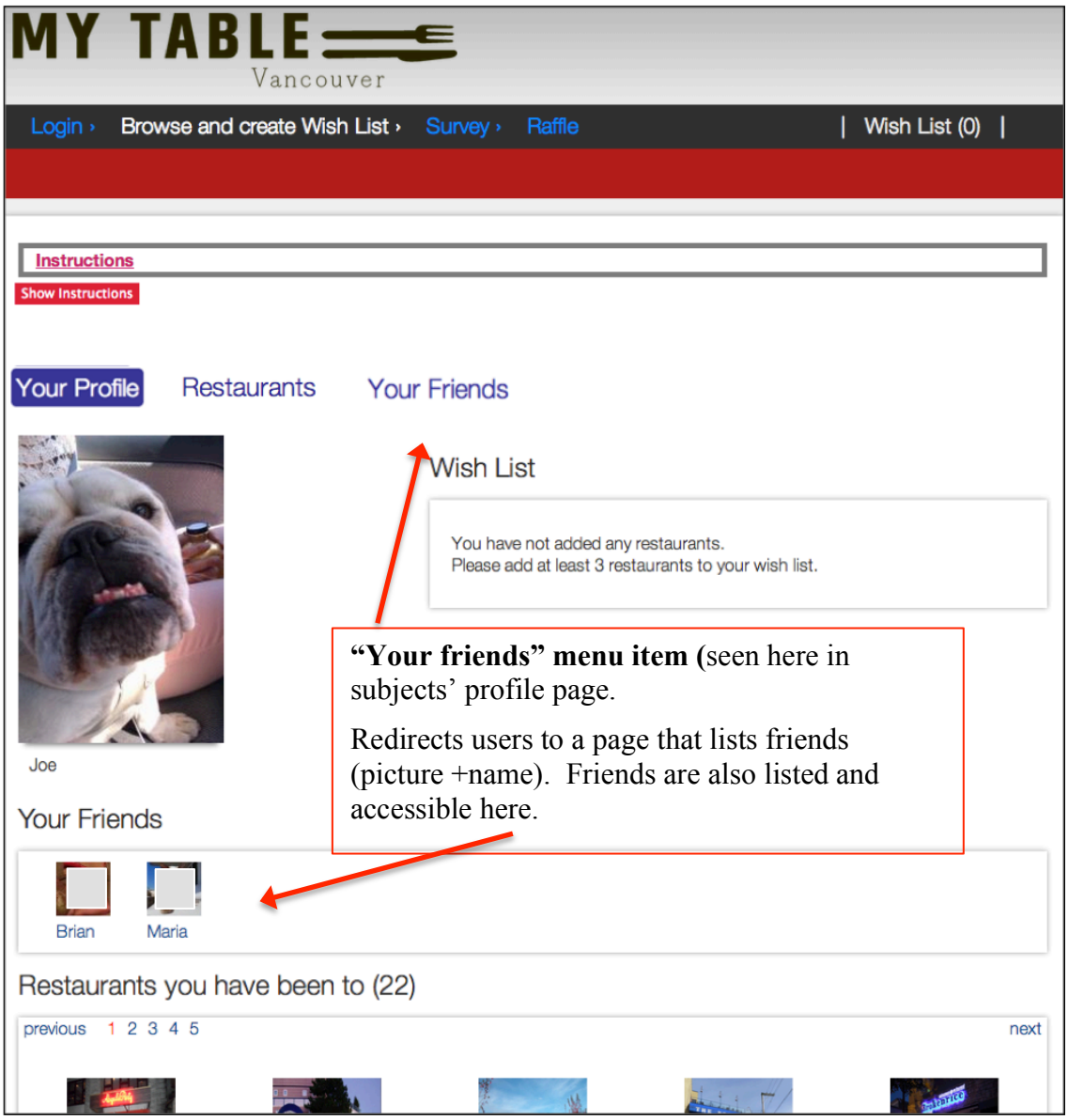


Figure E.6 Visibility of All Social Connections: the "X's Friends" Feature

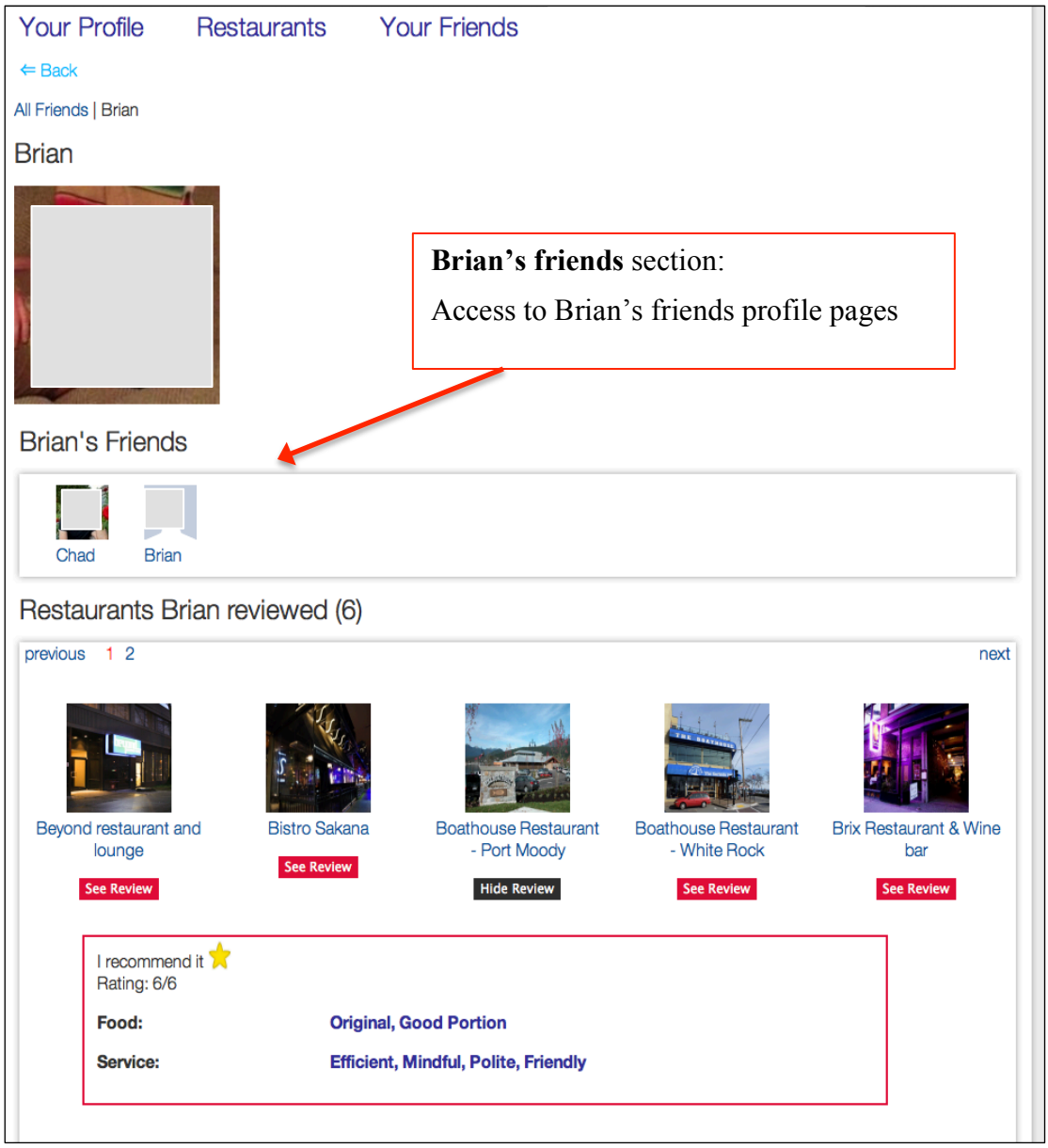
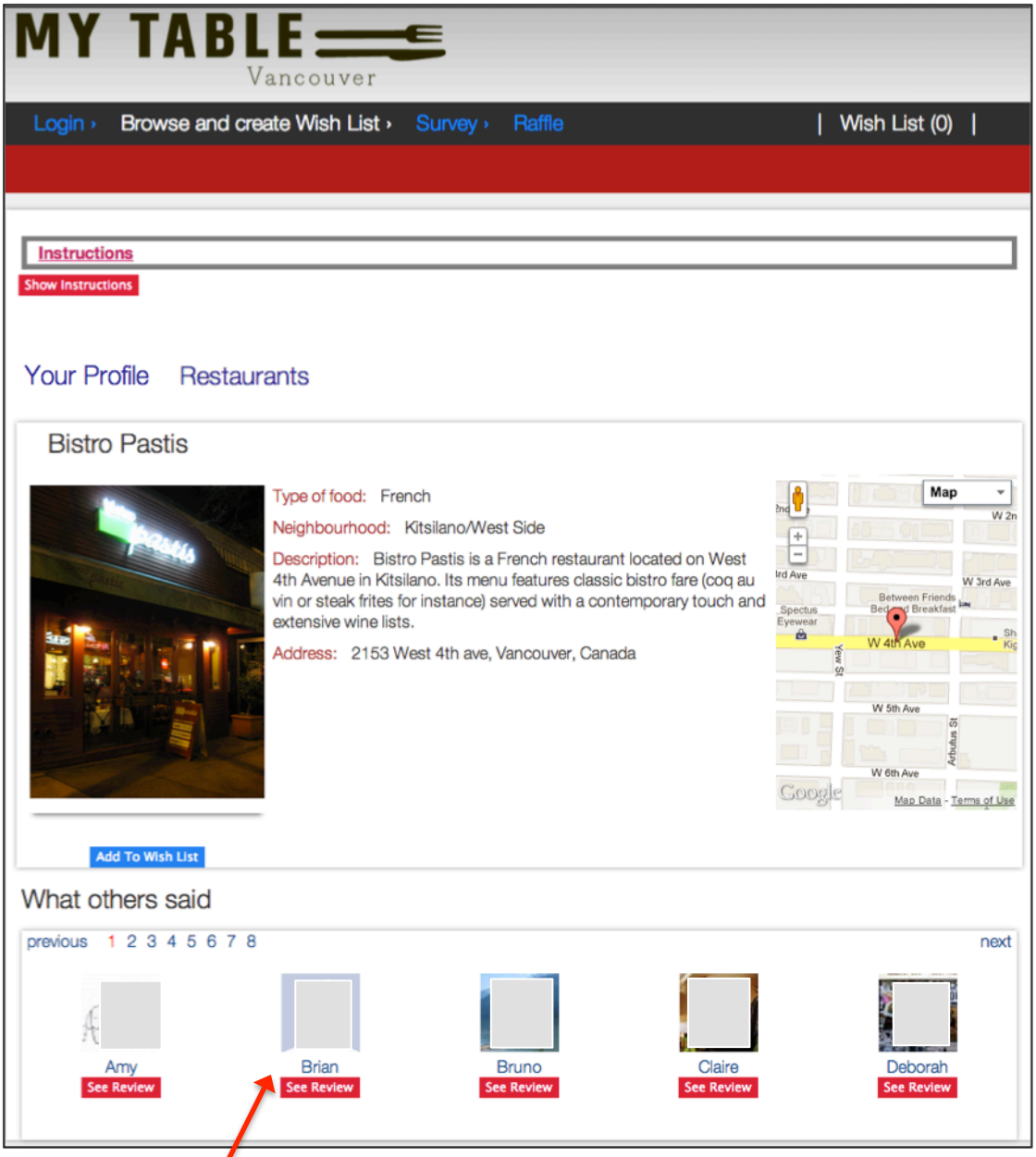


Figure E.7 Visibility of UGC: the "What Others Said" Feature



What others said section:

Reviews from the other My Table users

Appendix F Manipulation Check Tests: Robustness and Post-Hoc Tests (Paper #2)

Table F.1 ANOVA Results for Perceived Affordances (Manipulation Checks)

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.
MC1 (attribute filtering)	Between Groups	0.633	2	0.317	0.242	0.786
	Within Groups	107.414	82	1.31		
	Total	108.047				
MC2 (availability of content)	Between Groups	109.818	2	54.909	25.243	**0.000**
	Within Groups	178.37	82	2.175		
	Total	288.188	84			
MC3 (list of friends)	Between Groups	67.268	2	33.634	32.087	**0.000**
	Within Groups	85.955	82	1.048		
	Total	153.224				
MC4 (list of friends' friends)	Between Groups	20.793	2	10.397	5.929	**0.004**
	Within Groups	143.795	82	1.754		
	Total	164.588	84			
MC5 (social filtering)	Between Groups	39.971	2	19.986	15.046	**0.000**
	Within Groups	108.923	82	1.328		
	Total	148.894	84			

-In bold: values are expected to be significant ($p<0.05$)

Table F.2 Robust Tests of Equality of Means (Welch Statistic)

Dependent Variable	Statistic	Df1	Df2	Sig
MC1	0.257	2	56.644	0.775
MC2	22.012	2	54.348	0.000
MC3	39.239	2	52.983	0.000
MC4	5.468	2	54.535	0.007
MC5	25.919	2	53.768	0.000

Table F.3 Post-Hoc Tests for Perceived Affordances (Manipulation Checks)

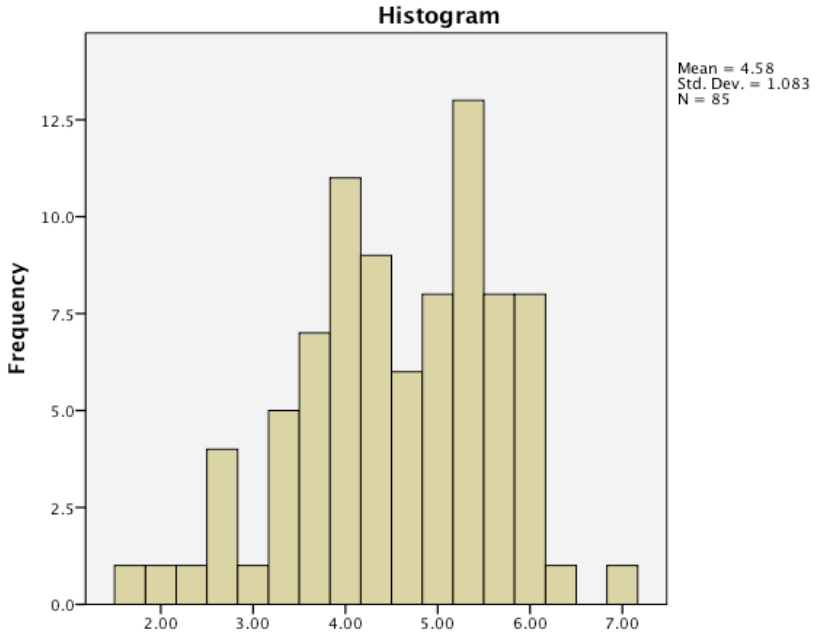
Dependent Variable	Group (i)	Group (j)	Mean Difference (i-j)	Std. Error	Sig.	Expected
MC1 (attribute filtering) *	Control	Private	-0.036	0.29	0.991	Non sig.
		Open	-0.19	0.28	0.762	Non sig.
	Private	Open	-0.16	0.31	0.865	Non sig.

Dependent Variable	Group (i)	Group (j)	Mean Difference (i-j)	Std. Error	Sig.	Expected
MC2 (content availability)	Control	Private	2.45	0.41	0.000	Sig.
		Open	0.16	0.41	0.919	Non sig.
	Private	Open	-2.29	0.38	0.000	Sig.
MC3 (list of friends) *	Control	Private	-1.75	0.29	0.000	Sig.
		Open	-2.17	0.25	0.000	Sig.
	Private	Open	-0.42	0.27	0.276	Non sig.
MC4 (friends' friends)*	Control	Private	0.01	0.31	0.999	Non sig
		Open	-1.02	0.33	0.008	Sig.
	Private	Open	-1.03	0.37	0.019	Sig.
MC5 (social filter)*	Control	Private	-1.47	0.28	0.000	Sig.
		Open	-1.60	0.26	0.000	Sig.
	Private	Open	-0.13	0.33	0.918	Non sig

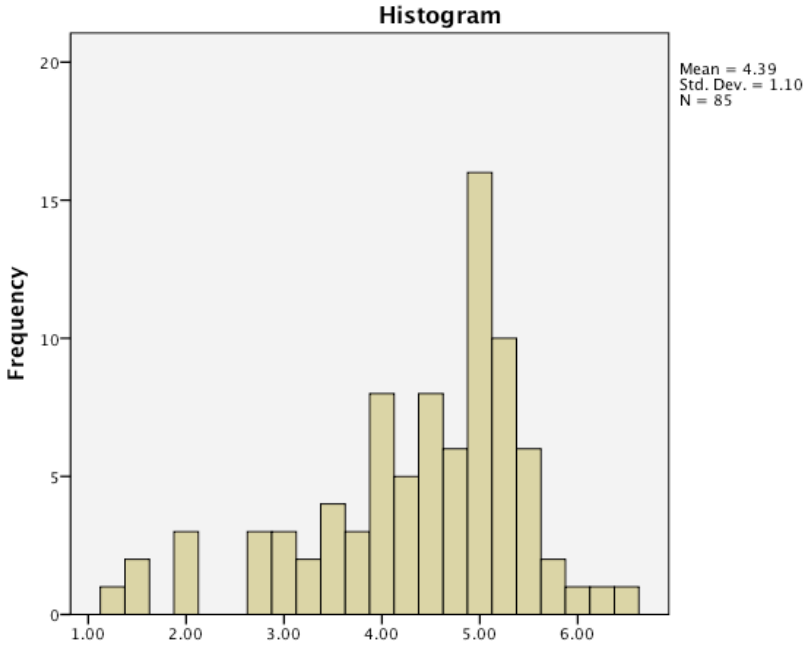
(*) Indicates that the Leven test for homogeneity of variances was significant, and therefore, that a Games-Howell post-hoc test (that also takes into account unequal group sample sizes) was ran in such cases. Otherwise, I used the Tukey HSD Test, which allows the comparison of any possible pairs of means.

Appendix G Distribution of the Research Model's Variables (Paper #2)

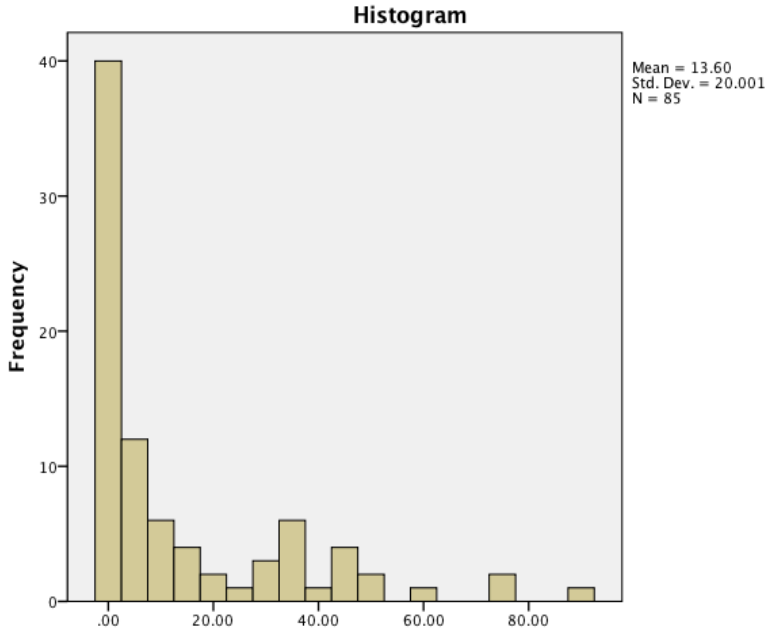
Serendipity



Diagnosticity

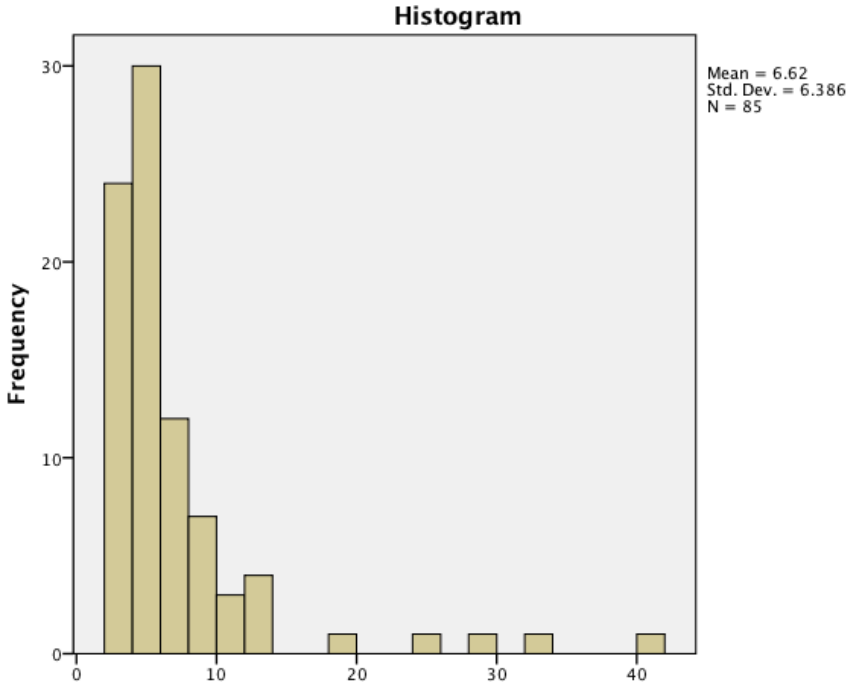


User-generated content (UGC)

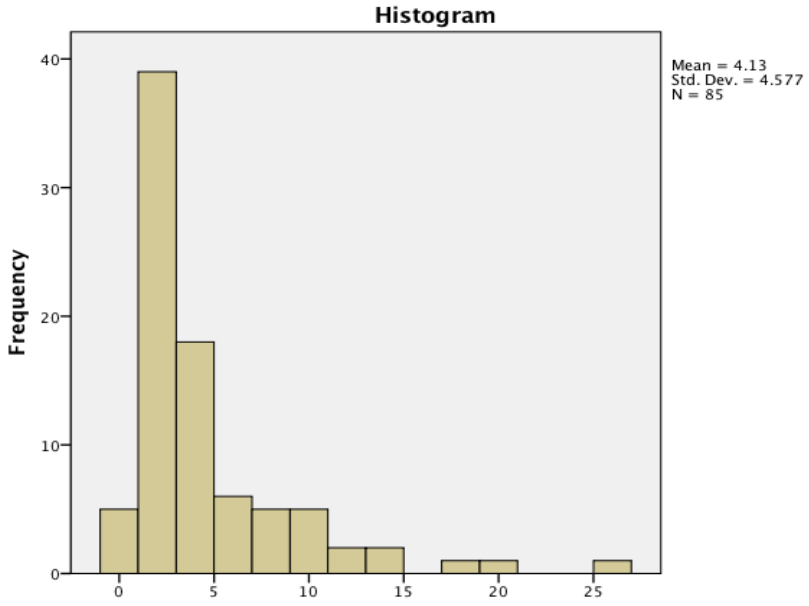


		Frequency	Percent
Valid	.00	26	30.6
	1.00	9	10.6
	2.00	5	5.9
	3.00	3	3.5
	4.00	2	2.4
	5.00	5	5.9
	6.00	2	2.4
	8.00	1	1.2
	9.00	2	2.4
	10.00	3	3.5
	13.00	3	3.5
	15.00	1	1.2
	20.00	1	1.2
	22.00	1	1.2
	23.00	1	1.2
	30.00	2	2.4
	31.00	1	1.2
	33.00	2	2.4
	34.00	2	2.4
	35.00	1	1.2
	37.00	1	1.2
	38.00	1	1.2
	45.00	3	3.5
	47.00	1	1.2
	48.00	1	1.2
	49.00	1	1.2
	58.00	1	1.2
	73.00	1	1.2
	74.00	1	1.2
	89.00	1	1.2
	Total	85	100.0

Product views (PV)

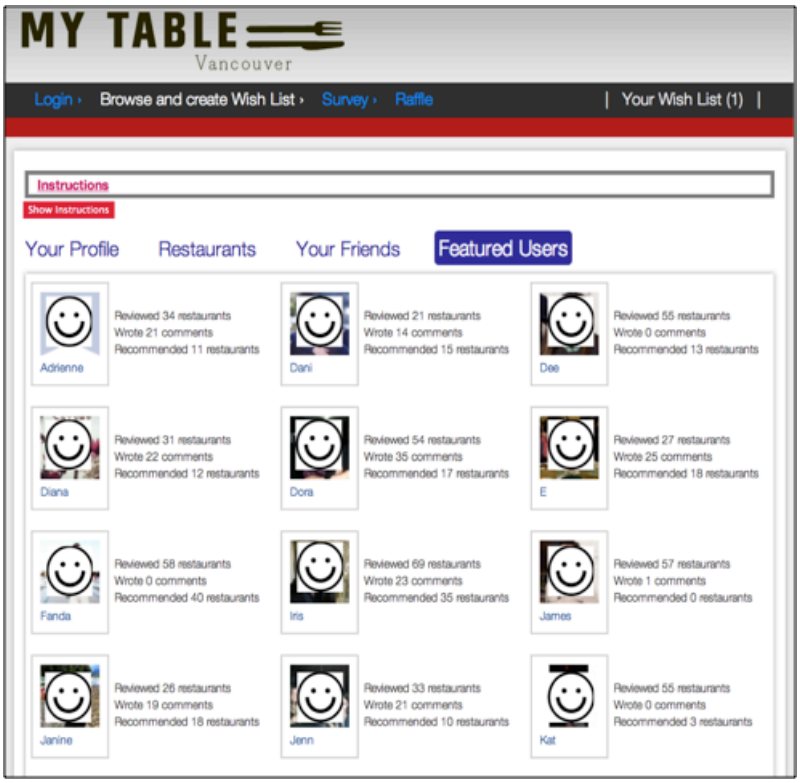


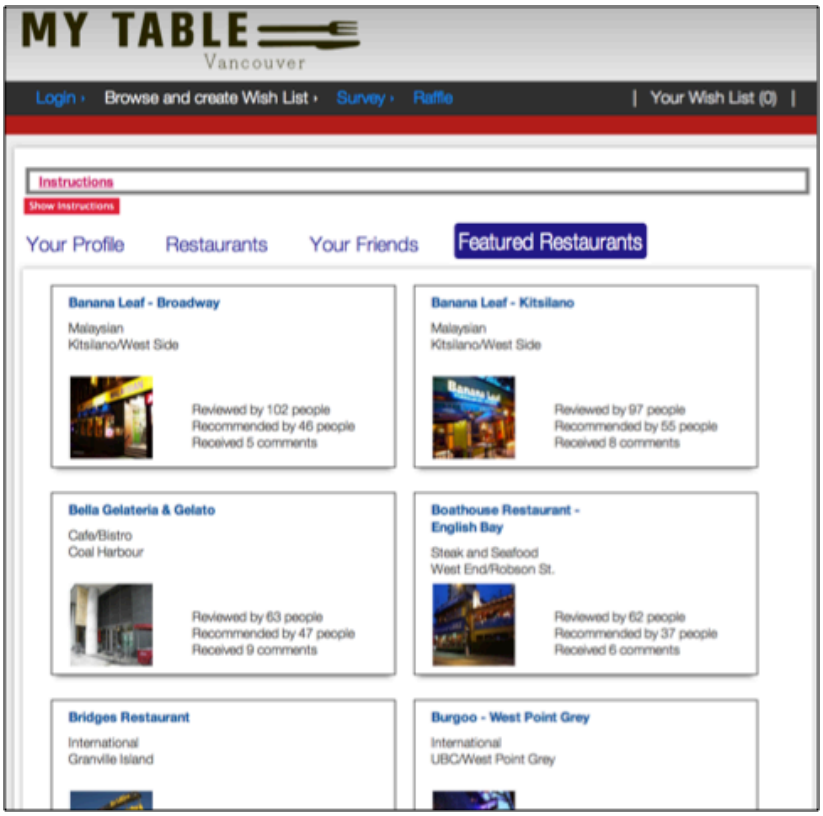
SN Size



		Frequency	Percent
Valid	0	5	5.9
	1	23	27.1
	2	16	18.8
	3	9	10.6
	4	9	10.6
	5	1	1.2
	6	5	5.9
	7	1	1.2
	8	4	4.7
	9	3	3.5
	10	2	2.4
	11	1	1.2
	12	1	1.2
	13	1	1.2
	14	1	1.2
	17	1	1.2
	20	1	1.2
	25	1	1.2
	Total	85	100.0

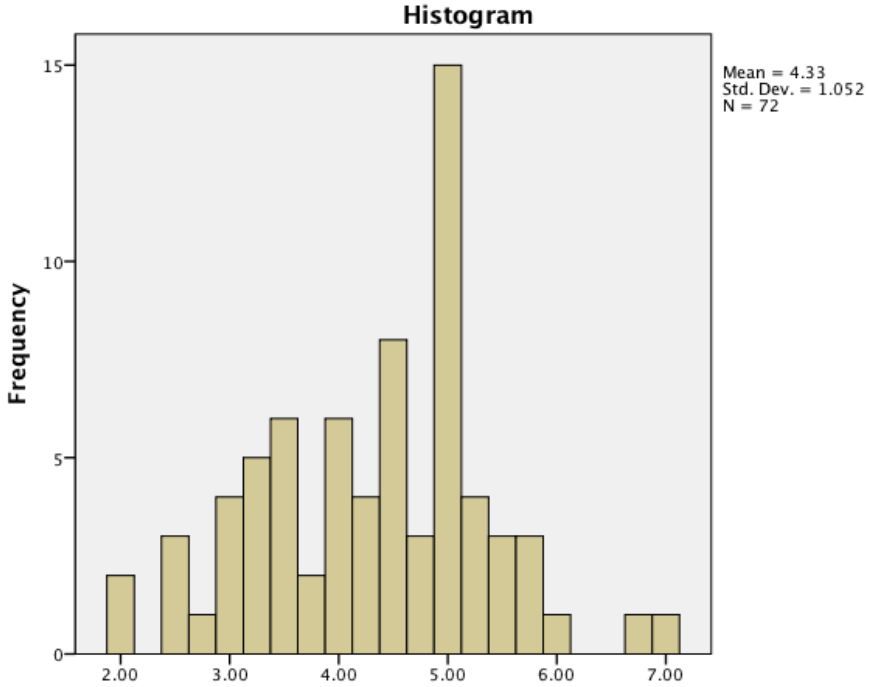
Appendix H Screenshots of Featured Users and Featured Restaurants Pages (Paper #3)



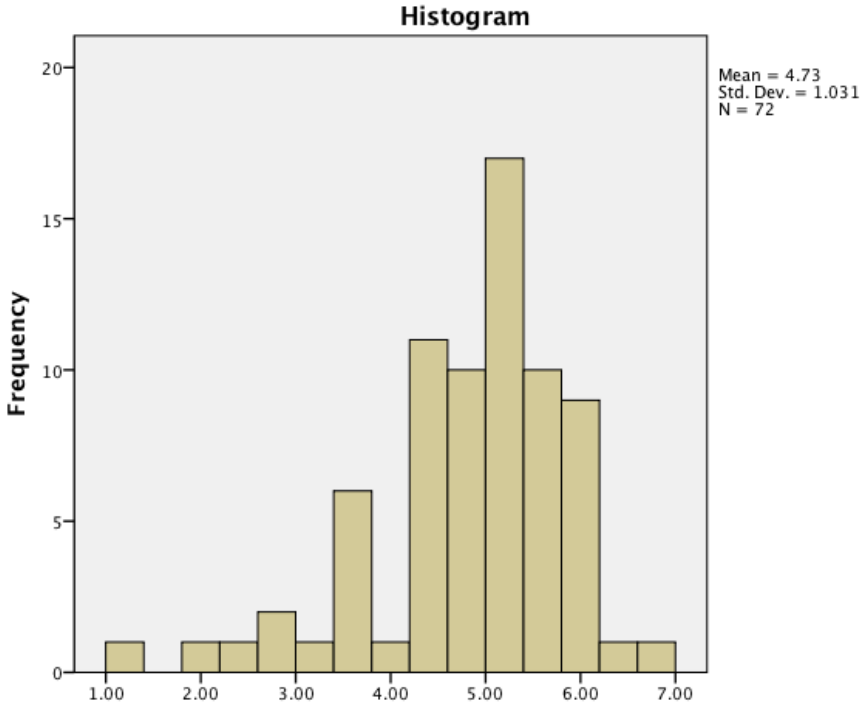


Appendix I Distribution of the Research Model's Variables (Paper #3)

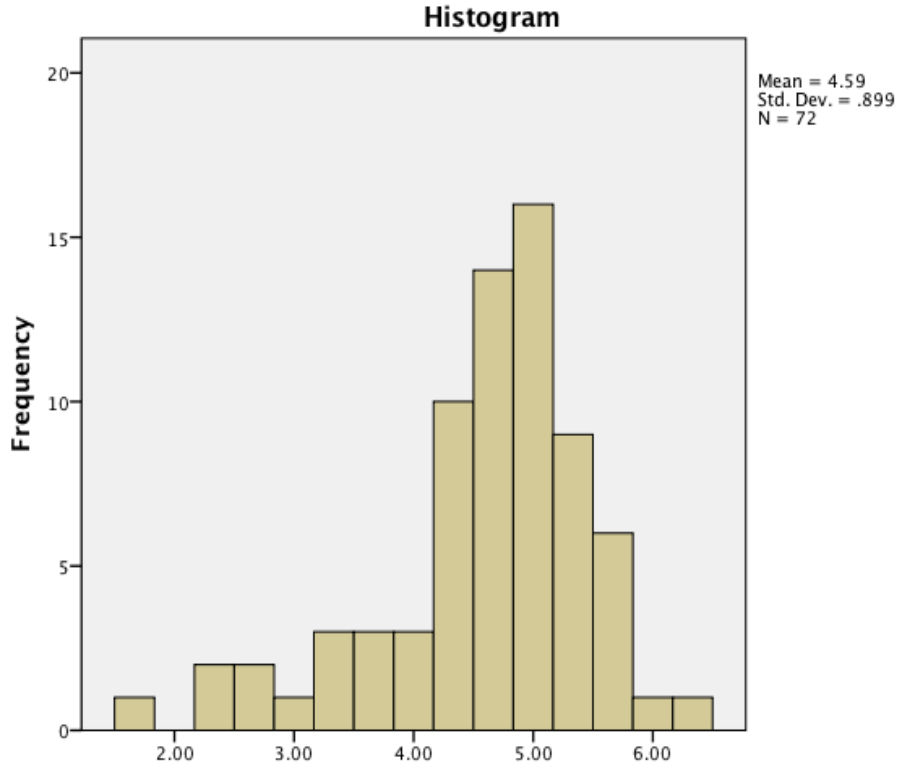
Perceived enjoyment



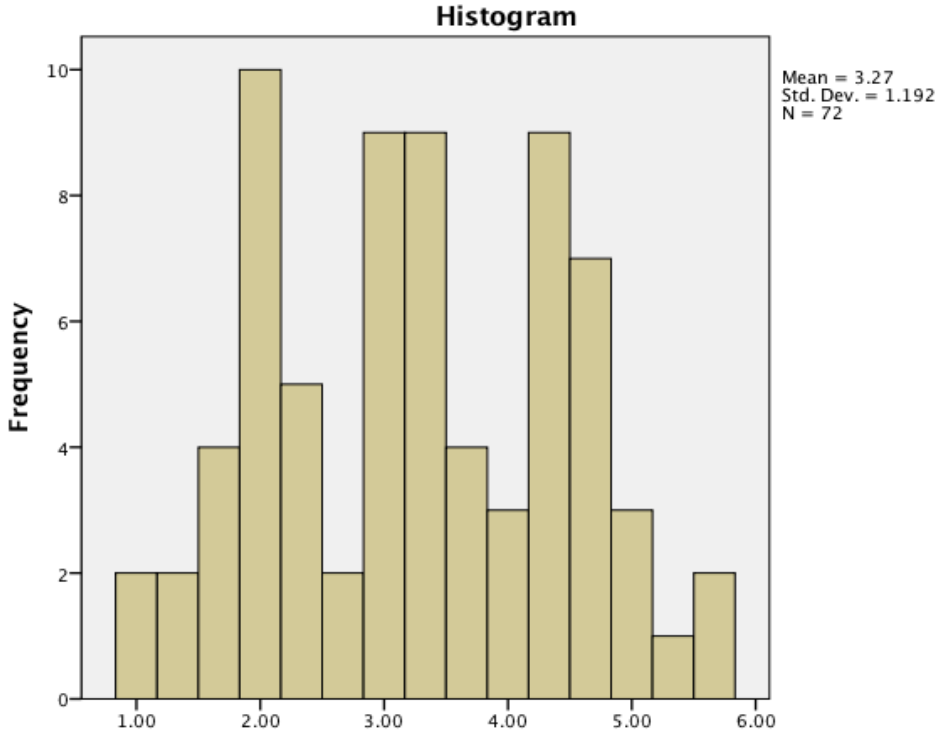
Perceived usefulness



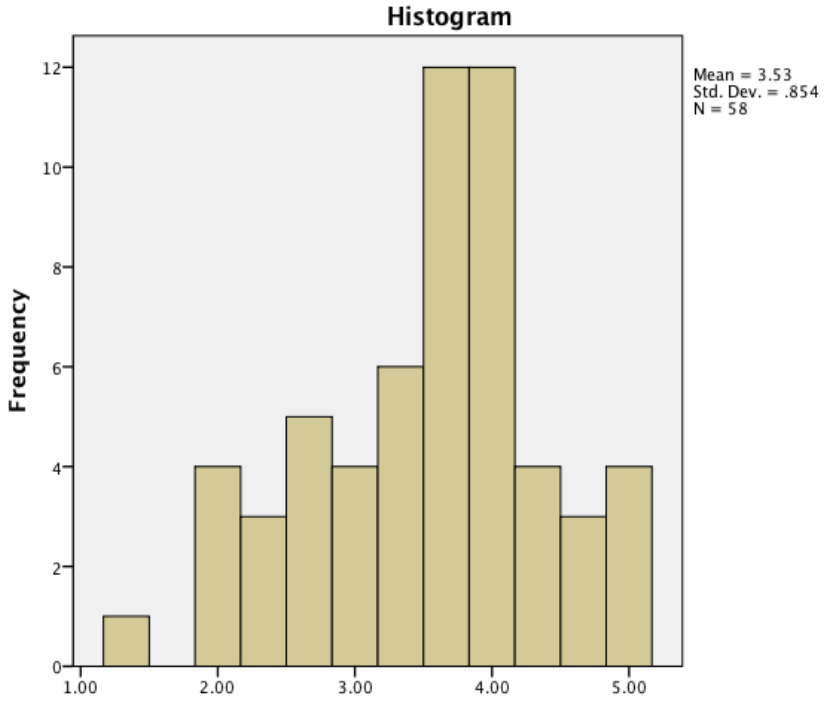
Cognitive curiosity



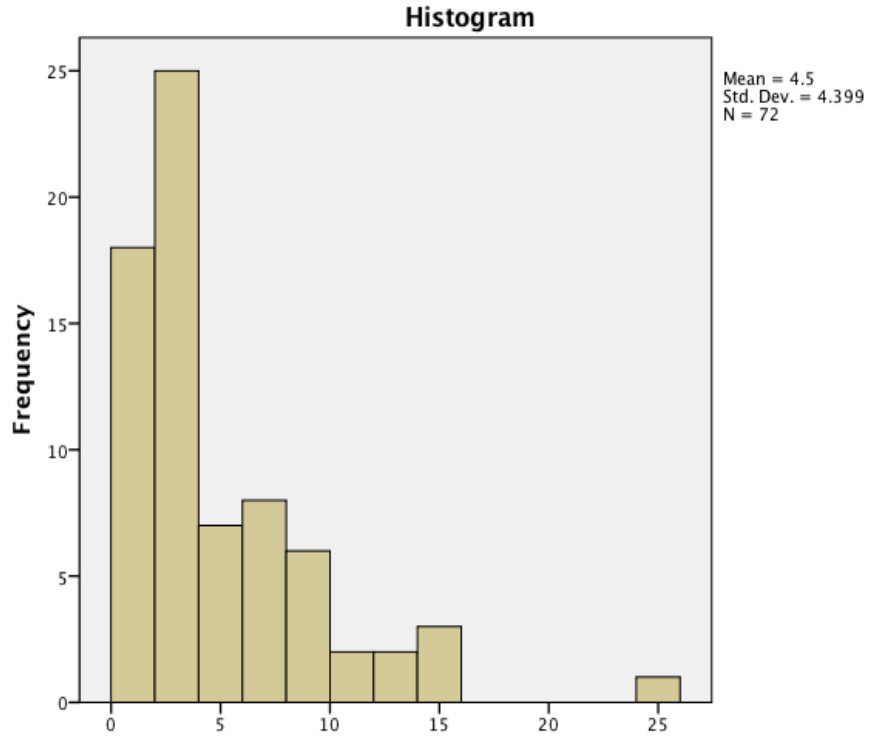
Cognitive effort



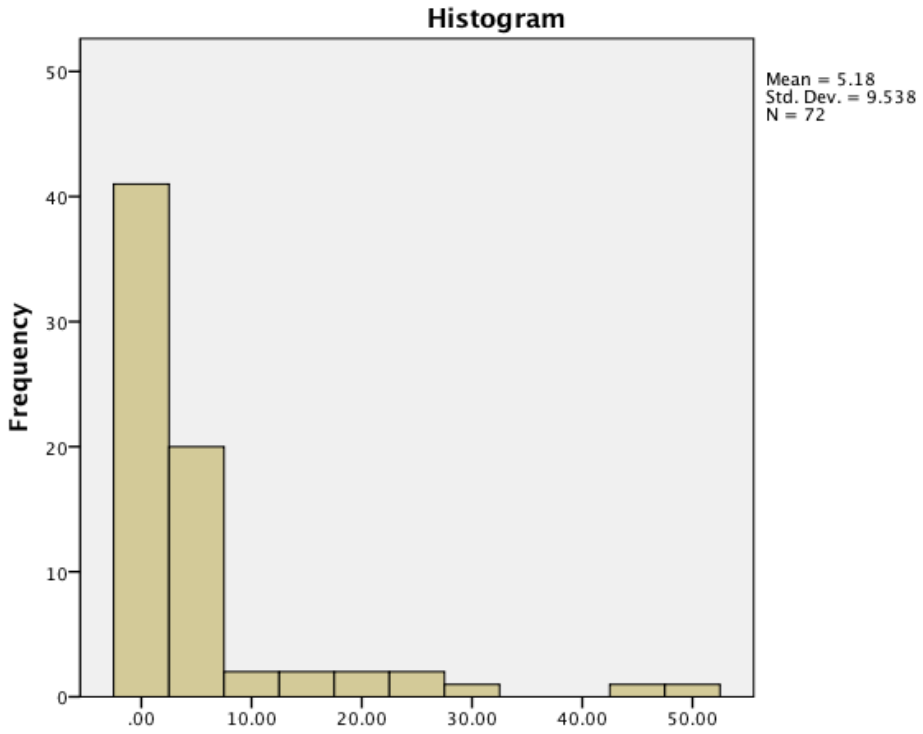
SN quality



SN centrality



SN Activation



Appendix J Supplementary Tests of H1a and H1b (Paper #3)

Given the nature of SN activation (an objective count measure), H1a and H1b should ideally be tested via a negative binomial regression. This approach is also more appropriate than Poisson regression when the dependent variable is over-dispersed (Hilbe 2011), as is the case for SN activation (its variance is superior to its mean). The data used to test H1 included the 82 subjects in my sample, from which the 10 network isolates were removed (i.e., those that had no friends), as this could generate an upward bias in correlations (i.e., having zero friends implies SN activation=0), and 14 cases that had missing data points for the SN quality variable. Thus, the resulting sample size available for testing H1a and H1b in a single negative binomial regression model was 58. Table J.1 reports the descriptive statistics observed for the variables involved in the regression test.

Table J.1 Descriptive Statistics of Negative Binomial Regression Analysis

Variables	Sample Size	Mean	Std Dev.	Min	Max
DV: SN activation	58	5.3	8.67	0	44
SN centrality	58	4.91	4.68	1	25
SN quality	58	3.54	0.85	1.13	5

The regression equation that was tested took the following form:

$$\textbf{log(SN activation)} = \beta_0 + \beta_1 \textbf{ SN centrality} + \beta_2 \textbf{ SN quality.}$$

Table J.2 shows that the likelihood ratio chi-square obtained from running the negative binomial regression model was significant (χ^2 =34.75, df=2, p=0.00). The *SN centrality* variable had a statistically significant coefficient of 0.13 (p=0.001), and the *SN quality* variable had a statistically significant coefficient of 0.53 (p=0.01), thus supporting H1a and H1b. Those coefficients represent the average difference between the log of expected SN activation *counts* (or rate, i.e., the number of friends' reviews read per each website usage

session) for each unit change of the independent variables. The incidence rate ratios (IRRs), also referred to as odds ratios, represent the percentage changes in SN activation, and are therefore a more easily interpretable metrics. In my context, the IRRs imply that for each additional friend in a consumer's SN, the number of friends' reviews consulted (i.e., SN activation) increases by 14.2%, and that this number increases by 70.5% for each one point increase in the average quality of a consumer's SN.

Table J.2 Results of Negative Binomial Regression Analysis

Parameters	B	Standard Error	95% Wald Confidence Interval		Hypothesis Test			IRR*
			Lower	Upper	Wald chi-square	df	Sig	
Intercept	-1.230	0.758	-2.72	0.255	2.634	1	0.105	0.292
SN size	**0.132**	0.0385	0.057	0.208	11.818	1	***0.001***	**1.142**
SN quality	**0.534**	0.2138	0.115	0.953	6.229	1	***0.013***	**1.705**

* IRR: Incidence Rate Ration (IRR=Exp(B)).

Appendix K Internal, Ecological, and External Validity (Papers #2 and #3)

	Enhance (+) or Threaten (-):		
Key Characteristics of the Empirical Setup (Papers #2 and #3)	**Internal validity**	**Ecological validity**	**External validity**
The My Table website's design was ***manipulated*** to create variance in how the SN-enabled shopping environment was implemented (private, open).	+		
The experiment and recruitment procedures (i.e., referral mechanism) enabled some degree of natural (i.e., based on real Facebook's friendships) ***interdependency*** among subjects.	+		
Subjects were ***randomly assigned*** to experimental conditions and groups were checked for ***homogeneity*** on a set of key variables.	+		
Subjects conducted the experimental task in a ***natural setting*** (i.e., not in a lab), that is, in potentially different contexts (e.g., home, work), time of day (before or after a meal), and using different types of computers (although access to my site was disabled for tablets and mobiles)	-	+	
Some subjects participated in the preliminary task but did not take part in the experimental part, perhaps leaving only the most motivated ones or the ones most interested in restaurants (***experimental mortality***). Note however that randomized data collection controlled for homogenous groups.	-		
The My Table site provided ***features*** very similar to those found in the real world (e.g., Facebook login, product liking and tagging, add to wish list).		+	+
The "***see review" feature*** enabled us to control for users' access to informational content but it is not common in real life settings.	+	-	
The experimental ***task*** (looking for information online about restaurants before choosing which one to go to) is commonly performed (Rainie et al. 2001).		+	+
Before starting their task, subjects had to examine a ***tutorial*** illustrating the key features and ways of interacting with the website (the effectiveness of this exercise was apparent in the results from analyzing manipulation check questions).	+	-	
Vouchers for the selected restaurants ***incentivized*** participants and motivated them to search for restaurants that would fit their preferences and expectations.	+/-		
The My Table ***social network*** exhibits typical properties of offline and digital social networks (i.e., small average geodesic distance, high clustering coefficient, preferential attachment in nodes' degree distribution).		+	+

	Enhance (+) or Threaten (-):		
Key Characteristics of the Empirical Setup (Papers #2 and #3)	**Internal validity**	**Ecological validity**	**External validity**
The average ***size of subjects' personal social network*** on My Table is relatively small (4 on average).			-
The ***sample*** is made of a diversified group of individuals in terms of gender (62.9% females, 33.9% males), age groups (from 19 to 65); occupancy (less than 50% were students).			+
The ***restaurants*** included in the study covered 14 different neighborhoods, 33 different food types, and from cheap to fine dining places.		+	
The ***restaurants*** on My Table were relevant to participants (their food and location preferences matched well with those available on the site, only five of the 287 restaurants were unknown to all users).		+	
A large amount of ***content*** (i.e., reviews) was created during the preliminary stage of the study (more than 30,000 tags, 3,000 recommendations, 5,000 ratings, and 750 open comments).	+	+	