Everyday Consumer Activities & Real-time Information Systems: Attitudes Towards Shopping Motivations & Advertisements

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Abstract

Previous research has shown that Internet-based services such as Twitter and Facebook are changing the way we share and access information. However, most studies focus on broad usage and do not deeply explore how individuals pursue specific activities using those services. This study uses a quantitative survey method to examine information seeking and sharing activities on Twitter around a specific everyday activity: consumer shopping. The goals of this study are to (1) describe the role of Twitter in everyday consumer activities, (2) explore how frameworks for understanding consumer behavior differ for Twitter users and on-users, and (3) propose implications for consumer behavior on Twitter and similar information communication systems. These goals are especially important given Twitter's recent introduction of keyword search advertisements to the user experience. Conducted in the weeks leading up to this change, the study found that Twitter use is positively associated with being motivated to shop to have the latest fashions and products, and enjoying shopping with others as a social activity. Twitter use is also positively associated with holding a more favorable and trusting view of advertisements, and using information in advertisements to guide purchase decisions. These findings have implications for consumer behavior on Twitter and similar real-time information systems, and the design and use of advertisements on these systems.

Keywords

Microblogging, consumer behavior, advertising, computer-mediated communication, shopping, information seeking, information sharing, real-time, information systems

Introduction

Consumer activity is part of everyday life, from routine shopping for groceries and clothing to less common purchases such as vacations and automobiles. Over the past decade significant consumer spending has shifted from offline to online, and consumers can shop virtually anywhere, for nearly anything. Perhaps at no other time has understanding consumer behavior, particularly what motivates people to shop, been more intriguing. Paralleling the rise in consumer activity online, advertising has become pervasive online. Consumers are confronted with advertisements when using search engines, social networking sites, and virtually every other type of online product and service. As in the past, consumers encounter advertisements throughout their physical environment as well. With advertisements a constant part of life, what are consumers' attitudes towards advertising?

In the past five years Internet-based real-time information communication systems have introduced new ways for individuals to interact with each other online. These systems allow users to post and exchange brief status update-like messages with one another, often in near-real time. Within seconds of a user posting a message other users may search for and read that message. Also commonly referred to as microblogging services, these systems often leverage mobile and desktop communication modalities for this information exchange. Twitter[1] and Tumblr[2] are two prominent systems, and social networking sites such as Facebook[3], Orkut[4], and LinkedIn[5] offer similar communication means. Recent figures show that nearly 20% of Internet users in the United States share and read information on Twitter [10], and that the service recently surpassed 100 million users worldwide [43].

This study examines the intersection of these two subjects. How do consumers use these systems, if at all, as part of their everyday consumer activities? For users and non-users of these systems, what are their motivations for shopping, and what are their attitudes toward advertising? What types of information do consumers seek from these systems, and how might it guide their behavior? Do consumers share details of their consumer behavior,

[1] Twitter. http://www.twitter.com
[2] Tumbler. http://www.tumblr.com
[3] Facebook. http://www.facebook.com
[4] Orkut. http://www.orkut.com
[5] LinkedIn. http://www.linkedin.com

such as what they have purchased or plan to purchase? Through querying consumer directly we may better understand the relationship between real-time information communication systems and consumer behavior.

This study is the third stage in an ongoing investigation of information seeking and sharing activities, specifically framed around everyday shopping activities. The investigation began in summer 2009 with a grounded theory-based ethnographically inspired interview and shadow study of shoppers in the San Francisco Bay Area, which resulted in prototype mobile phone shopping applications for the Apple iPhone [7]. The second stage in late 2009 involved a diary and interview study of similar shoppers during the holiday shopping season [7]. This third stage serves as a deeper investigation of the themes found in these earlier studies, specifically the role of the real-time information systems Twitter[6] in everyday consumer activities. While this stage focuses on Twitter, the study is modeled for replication on a complementary system such as Facebook, or any other real-time information communication systems that may arise.

[6] Several real-time communication and similar systems were considered for exploration in this study, including Facebook, MySpace, Tumblr, and Twitter. Twitter was selected as the venue for study because it has a large user base, the study builds on the researcher's earlier work in the space, and there are numerous opportunities to pursue potentially groundbreaking work. Additionally the company provides access to user data through publicly available application programming interfaces, which may be utilized for subsequent studies.

Related Work

This study builds on previous work in two primary areas: the use of real-time Internet-based information microblogging services such as Twitter, and consumer behavior, specifically consumer shopping motivations and attitudes towards advertisements.

Twitter & Real-time Information Communication Systems

Within a year of its launch in late 2006 the first studies of Twitter and its use emerged. These early studies were broad attempts to understand these new types of Internet-based communication services. In 2007 Java et al. found that people use Twitter to provide status update-like chronicles of their daily activities, as well as to seek and share information [20]. Subsequent studies continued on this path, providing a richer understanding of Twitter users' motivations [44] and proposed a typology of Twitter users based on users' following and follower communities [21]. At the same time studies began to examine the use of Twitter in specific situations, particularly coordination during disaster responses [38]. These early studies provide researchers with a grounded understanding of Twitter.

In 2009 studies began to explore how users converse on Twitter, including the user-initiated adoption of symbols to direct conversations in an otherwise unstructured communication channel [18]. Boyd et al. identified why and how users adopt these "re-tweet" conventions to guide conversations on Twitter, and categorized various types of re-tweeting behaviors and users' motivations [6]. Naaman et al. examined users' behavior and found that the majority of Twitter users were *meformers,* more interested in talking about themselves than sharing information others would be interested in learning [23]. Studies began to focus on specific user activities on Twitter, such as turning to it as a source for local and global news [11], as a means to virtually participate with live media events [32], and as a means to pose questions to ones' social network [22]. These studies indicate the breadth of activities user pursue on Twitter, and imply that the service may be much more than a means to share status update-like messages.

Recent studies have examined the intersection of consumer behavior and Twitter, including exploring the presence of consumer brand names in messages and Twitter's emerging role as a channel for consumers and businesses to engage in electronic word of mouth marketing [19], and its use by consumers as a means to engage with ones social network while shopping [7]. These studies also hint at the growing prominence of advertising on Twitter, raising questions of how users consume, perceive, and act on those advertisements.

Consumer Behavior: Shopping Motivations

Consumer behavior is the study of "when, how, why, and where people buy or do not buy products and services" [30]. Formal empirical studies of consumer behavior began as far back as the late 1790s and were often grounded in economics [34]. Of late studies have encompassed sociology, social anthropology, and psychology, and have shifted from modeling consumer behavior with complex formulas to using a grounded theory approach to offer new notions of how and why consumers act the way they do. While much of this research is done in academia, readers may be familiar with consumer behavior and its concepts from publications in the popular press. Paco Underhill's books detail how retail shopping environments are designed to engage consumers in certain behaviors [39]. Malcolm Gladwell's work brought the concept of *word of mouth* to public use, describing how individuals route information between groups and how that influences consumer behavior [16]. Dan Ariely's work in behavioral economics often uses experiments to explore the balance of rational and irrational behavior in consumer activities [2]. Given the multitude of subtopics within consumer behavior, this study chooses of its foundations: consumers' motivations for shopping.

Work examining shopping motivations began in the 1950s with the introduction of shopper typologies; positing that there are distinct types of shoppers each with its own unique needs, attitudes, and approaches to the shopping experience [36]. Through the years this work continued with researchers proposing a myriad of different frameworks to categorize shoppers in various shopping environments, such as with catalogs and on the Internet [14][28]. For example, shoppers may be categorized as *economic, personalizing, ethical,* and *apathetic* [36], or *recreational* and *economic* [5]. Studies explored the fun, exciting, and hedonic motivations for shopping [3], while others explored apathetic shoppers and their motivations [25]. Studies also considered that a primary motive for shopping was not about purchasing at all, but rather to serve as a social event or diversion from other activities [39]. Often these frameworks are very environment-specific and their findings do not readily translate to other cultures and shopping channels, which is understandable given the complexity of the topic. This early and recent work must be heralded for reducing a complex topic into testable components, which could then be reassembled into broader theoretical concepts.

One early study that translates well to the current online and offline shopping environment is Westbrook and Black's study that proposed a nuanced framework incorporating a collection of motivational factors [41]. Similar to many studies in the space at the time, Westbrook and Black grounded their work in interviews with female shoppers at a suburban mall. However their framework is not gender-specific, and can be used for single- and mixed-gender studies. The study proposed that there are seven unique dimensions to shopping motivations: anticipated utility, role enactment, negotiation, choice optimization, affiliation, power and authority, and stimulation. A consumer's broad level of "shopping motivation" is composed of how motivated they are for each proposed dimension. From their study:

1. Anticipated utility "denotes shopping motivations linked to the expectation of benefits… which will be provided by the products to be acquired."
2. Role enactment "describes the motivation to identify with and assume culturally prescribed roles regarding the conduct of shopping activity."
3. Negotiation is the "motivation to seek economic advantage through bargaining with" retailers.
4. Choice optimization is the "motivation to search for and secure precisely the right product to fit one's" needs.
5. Affiliation is the motivation to socialize "directly or indirectly with other individuals" while shopping, including "other shoppers and retailers."
6. Power and authority is the motivation to shop in order to "attain an elevated social position", particularly between the shopper and retailer.
7. Stimulation is the motivation "to seek novel and interesting stimuli from the retail environment," such as excitement and other emotions.

For each proposed dimension Westbrook and Black crafted two to three scenario-statements and asked participants to report how much satisfaction she would typically receive from the scenario. For example, to assess a participant's *affiliation* motivations, she would be asked how much satisfaction she typically received from each of the following activities:

1. *Shopping alongside other customers who have similar tastes as mine.*
2. *Talking with salespeople and other shoppers who are interested in the same things as I am.*
3. *Shopping with friends as a social occasion.*

Participant responses would then be averaged by dimension. With this framework a consumer may be more motivated to shop by *stimulation* than *choice optimization*, while another consumer is more motivated by *affiliation* than *role enactment*; however *all* dimensions are considered. Each consumer is unique, and their motivations are not bluntly reduced to a single dimension, as was done with earlier studies.

Westbrook and Black's study is held in continued regard to this day for introducing a broad framework that covered many to all types of shoppers and their motivations. While it is oriented towards brick and mortar shopping, its' framework is most readily adapted for a more present-day shopping environment encompassing both online and offline experiences. Their sample population was entirely women, however their framework and means for categorization motivations is gender-neutral. Given the high regard for their framework and its adaptability, it was selected as the model for gathering Twitter users' and non-users shopping motivations in this study.

Consumer Behavior: Advertising

A second component in consumer behavior explored in this study is consumers' attitudes towards advertisements, both offline and online. Research on public opinion of advertising arose in the 1960s, when it was found that consumers expressed a somewhat favorable attitude [4]. Over the past forty years this sentiment has consistently waned, with recent studies showing that the public is largely distrustful of advertising [31]. Given such a consistent sentiment, one must wonder why researchers continue exploring this thread.

With each introduction of new advertisement types it is valuable to understand consumer sentiment towards those new types. In that interest studies have examined attitudes towards television advertisements [1], Internet advertisements [31], video games [23], and mobile phones [40]. Now with the introduction of a new communication channel where advertisements have a growing presence, Twitter, it is beneficial to revisit consumer attitudes. Recent work is beginning to examine the role of advertisements on Twitter, though little has reached publication. Earlier mentioned work on electronic word of mouth marketing is the closest related research [19].

This study considered focusing exclusively on the perception of advertisements *on* Twitter, however an exploratory study found that users could not agree on what was an advertisement on Twitter, unlike with television or radio. For example, Beverly Hills-based Sprinkles Cupcakes[7] posts frequent messages about new flavors and daily promotions, which if seen on television would be widely seen as advertisements. A handful of Twitter users following Sprinkles were asked if they received advertisements via Twitter: some identified these messages as advertisements, while most did not. Eliciting users' perceptions of these messages as advertisements could be quite challenging through a survey. Given this challenge, it was decided to first gather users' baseline attitude toward advertisements in general. Subsequent studies may explore why consumers did not categorize these messages as advertisements.

With this decision, numerous studies of consumer attitudes towards advertising, including those cited earlier, were considered as models for this inquiry. Schlosser's study focused exclusively on Internet advertisements [31], however the questions posed to participants in the survey were excellent candidates for reframing to an offline and online context. The study found that five factors contributed to participants' attitudes about Internet advertisements:

[7] Sprinkles Cupcakes. http://www.twitter.com/sprinkles

1. Advertising utility: Are advertisements “informative, entertaining, or useful for making decisions”?
2. Indignity: Do consumers feel “insulted, offended, or misled” by advertisements?
3. Trust: Do consumers trust advertisements?
4. Price perceptions: Do consumers feel advertising results in higher or lower prices?
5. Regulation: Should there be more or less regulation of advertisements by the government?

For each factor a collection of two to three questions were posed to participations. Participants were additionally asked a general question about how much they liked advertising. For example, to assess a participant’s *advertising utility* factor, she would be asked for her response to the following statements:

1. *Most advertising is informative.*
2. *How often do you use advertising to help make your purchase decisions?*
3. *In general, how confident do you generally feel using information you see in an advertisement to make a purchase decision?*

Similar to Westbrook and Black’s study of consumer shopping motivations, Schlosser’s study presents a framework of questions that can be applied to a variety of contexts. For this study, the questions were reframed from being Internet-focused to more general attitudes, encompassing both offline and online advertisements. Given the recent introduction of more recognizable advertisements on Twitter, subsequent phases of this study may more deeply explore attitudes towards these advertisements specifically on Twitter.

Research Questions

In light of this earlier work on Twitter use and consumer behavior, numerous research questions present themselves. While considerable work has examined consumer shopping motivations and attitudes towards advertisements, these studies have not focused on examining differences and similarities between users and non-users of specific Internet technologies, such as Twitter. Previous studies of Twitter have established a foundation for understanding elemental use, such as why people use the service and with whom. Fewer studies have examined specific uses of Twitter, particularly those related to everyday activities such as shopping. This study focuses on the following three questions:

[RQ1] How are consumers using real-time microblogging systems such as Twitter as part of their everyday shopping experiences?

[RQ2] How do frameworks from previous studies on consumer behavior differ between Twitter users and non-users?

> *[RQ2.1] How do Twitter users' and non-users' motivations for shopping differ?*

> *[RQ2.2] How do Twitter users' and non-users' attitudes towards advertisements differ?*

These research questions are addressed with empirical data collected via this study's survey of Twitter users and non-users. The study additionally considers a third question:

[RQ3] What are possible implications of this study for consumer behavior on Twitter?

This third question is especially important given the recent and significant change to the Twitter user experience: the introduction of paid keyword search advertising. This study provides insight into consumer behavior and Twitter *before* the introduction of advertising, and can be used as a comparison for future studies.

Methodology

This study used an online survey method to gather data on consumers' online behaviors and attitudes about shopping and advertisements. The survey was targeted at consumers eighteen years and older throughout the domestic United States and ran for ten calendar days in early April 2010. Participants were recruited via listings in the community volunteer section of Craigslist web sites throughout the domestic United States. Participants who completed the survey were eligible to be randomly selected to receive a nominal gift card. The survey collected participant sociodemographic and Internet usage data, as well as data about participant attitudes towards shopping motivations and advertisements. For those participants using Twitter, data about their use of the system was collected as well. The University of California, Berkeley Committee for the Protection of Human Subjects approved this study under protocol number 2010-01-652.

Survey Creation, Testing and Iteration

The survey was tested and revised in both paper and web-based forms. A paper-based version was distributed to a pilot group (N = 10) to assess themes, question selection, duration, and proposed compensation. Survey testers were then interviewed for feedback, which was incorporated into subsequent survey drafts. A web-based version of the survey was then created using LimeSurvey, an open source survey tool. LimeSurvey was selected because it offers greater design flexibility, lower costs, and improved data security than similar survey tools. The survey was hosted on a web server at the University of California, Berkeley. This web-based survey was tested with a second pilot group of students and alumni of the University of California, Berkeley (N = 30). Their feedback was used to further iterate the questions, flow, and visual design. All pilot participants were instructed that their responses would not be included in the study sample and analysis. The final web-based survey contained 79 questions and took approximately 10 minutes to complete.

Participants and Procedure

Study participants were recruited via postings in the community volunteer section of Craigslist sites around the domestic Unites States. Craigslist was selected in an effort to better diversify the participant sample.[8] Future iterations of this study may be promoted on Twitter, Facebook, and other venues. The sample in this survey is not representative of the entire Internet population. Participants represent those Internet users who frequent the Craigslist community volunteer section, are interested in contributing to research, and may be motivated to participate in such research for the potential to receive nominal compensation.

The survey was advertised on forty Craigslist sites, including high traffic metropolitan sites such as New York City and Chicago and lower traffic sites such as Omaha and Anchorage [12]. The community volunteer section of each site is known as a destination for recruiting participants for various types of volunteer activities and is widely used for this type of research. Each listing included a brief overview of the research topic and the offer that participants who completed the entire survey would be eligible to be randomly selected to receive one of ten $25 gift cards to a popular online retailer. Each listing contained a unique link to the survey so that the data set would indicate which advertisement a participant clicked before viewing the survey. Due to variations in how web browsers handle links with such referral codes this response tracking method was not entirely reliable. In the survey respondents were asked to indicate their community type, which provides a similar data point for analysis. In compliance with the requirements for the protection of human subjects each listing also revealed the researcher's identity as a student affiliated with the University of California, Berkeley.

[8] Additional recruiting venues were considered, including Twitter, Facebook, flyers on public notice boards, and email message lists. Given the topic, Twitter would seem a proper recruiting venue, however it was not selected because the survey sought individuals who did and did not use Twitter. In addition, promoting the survey via the researcher's personal Twitter account could raise bias issues, as the community is largely homogenous, made up of similar individuals researching the Internet, working in technology, and/or based in and around the San Francisco Bay Area. The same is true for the researcher's Facebook community.

The survey was promoted on Craigslist sites for a period of ten days in early April 2010, just before the announcement and launch of Twitter's new advertising platform. The goal was to recruit over 400 participants. During this period 531 individuals responded to the Craigslist solicitations as recorded in the survey database. Of these, 439 participants fully completed the survey (82.67%).

Data Cleaning and Integrity

Prior to analyzing the survey data responses were reviewed for cleanliness and integrity. Multiple responses from the same email address were flagged, as well as responses that contained incomplete email addresses. After this cleaning the sample pool was reduced by 4.55% to N = 419.

Survey Questions

Survey questions were grouped into the following categories: confirmation of informed consent, Internet usage, attitudes towards shopping motivations, attitudes towards advertising, Twitter usage, and sociodemographics. Only participants who identified themselves as Twitter users were shown questions about how they used Twitter, otherwise all questions were displayed to all participants.

Statement of Informed Consent

In accordance with best practices for such research, the survey began with a statement of informed consent detailing the motivations and themes for the study, that it was being conducted by researchers at the University of California, Berkeley, was approved by the Committee for the Protection of Human Subjects, and was limited to individuals 18 years of age and older. Individuals asserted their consent to this statement by clicking a "Next" button, which took the participant to the first group of survey questions on Internet usage.

Internet Usage

In any study of online activities it is helpful to gather data on which online sites and services participants currently use and how frequently. Participants were asked to report how frequently they use search engines (such as Google, Bing, Yahoo), social networking sites (such as Facebook, LinkedIn, MySpace), microblogging sites (such as Twitter, Blippy, Foursquare), shopping sites (such as Amazon.com, Walmart.com), review & recommendation sites (such as C/Net, Yelp), and classified advertisement sites (such as Craigslist.org). Frequency was indicated on a 7-item ordinal frequency scale (1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day). The displayed order of these services was consistent for all participants.

Consumer Behavior: Shopping Motivations

Participant attitudes towards shopping motivations were assessed through their responses to s collection of eight agreement statements posed on a 7-point Likert-style scale (1 = Strongly disagree, 2 = Disagree, 3 = Slightly disagree, 4 = Neither disagree or agree, 5 = Slightly agree, 6 = Agree, 7 = Strongly agree). These statements were selected from Westbrook and Black's study of consumer shopping motivations [41]. Westbrook and Black utilized a Cronbach's alpha method for each dimension in order to improve results reliability. Due to survey length concerns one question was selected to represent each of their seven proposed shopping motivations. One dimension, *role enactment*, included two questions: one on *comparison*-shopping and the other on *hunting.* These may be slightly different motivations, so they were both selected to see if they elicited widely disparate responses. Additional statements include, "I enjoy being one of the first to have the latest in new fashions or new products" and "I enjoy shopping with friends as a social occasion." Similar to Westbrook and Black's study, the displayed order of these statements was randomized for each participant.

Consumer Behavior: Attitudes towards Advertising

Participant attitudes towards advertising were gathered through their responses to eight agreement statements posed on a 7-point Likert-style scale (1 = Strongly disagree, 2 = Disagree, 3 = Slightly disagree, 4 = Neither disagree or agree, 5 = Slightly agree, 6 = Agree, 7 = Strongly agree). These statements were selected from Schlosser's 1999 study of attitudes towards Internet advertising and general advertising [31]. As with the collection of shopping motivation statements, not all of the statements in the Schlosser survey could be included in this study due to survey length concerns. Statements were selected to match the factors Schlosser proposed: one statement for advertising utility, indignity, trust, price perceptions, and regulation. Two additional statements were selected to represent Schlosser's *advertising utility* factor, as they focus on the role of advertising on consumer behavior. These statements are "I often use advertising to help make purchase decisions" and "In general, I feel confident using information I see in an advertisement to make a purchase decision." Schlosser posed these statements on a 5-point Likert-style scale, however for easier comparison with the shopping motivations statements and a more consistent survey experience a 7-point Likert-style agreement scale (as described above) was chosen. Similar to Schlosser's study, the order of these statements was randomized for each participant.

Twitter: Public, Private, and Non-Users

Questions on participant Twitter use opened with asking participants to indicate their use of Twitter on an ordinal scale (1 = Public - anyone may follow, 2 = Private - only people you approve may follow you, 3 = I don't have an account). An ordinal scale was used instead of a dichotomous scale in order to capture with one question whether the participant used Twitter and if so, if their Twitter account was public or private. For those participants who indicated they did not use Twitter, they were forward to the final set of sociodemographic questions. Twitter users continued with the following questions.

Twitter: Length of Use, Activity Frequency, and Access Methods

Twitter users were presented with a number of questions asking how long they had used Twitter, how often they do certain activities on Twitter, and how often they access Twitter via various methods. Length of use was captured on a 6-item ordinal scale (1 = Less than 3 months, 2 = 3 - 6 months, 3 = 6 - 12 months, 4 = 1 - 2 years, 5 = 2 - 3 years, 6 = More than 3 years), where the higher the response value the longer the participant had used Twitter.

Twitter activity frequency was captured through participants indicating how often they read messages, re-tweet a message, post a message, reply to a message, send a direct message, and search Twitter. Activity frequency was indicated on a 7-item ordinal frequency scale (1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day). The higher the response value, the more frequently the participant pursues that activity on Twitter.

Twitter offers users a number of ways to interact with its system. Participants were asked to indicate how often they interact with Twitter via SMS (short message service, on mobile phone), a web browser, a third-party application, a mobile web browser, and a mobile third-party application. During survey testing it was found that some participants were uncertain what *third party* meant, so a selection of frequently used applications[9] were displayed for participants. Access method frequency was indicated on a 7-item ordinal frequency scale (1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day). The higher the response value, the more frequently the participant accesses Twitter via that method.

Twitter: Following & Follower Community

Twitter users were asked how many people they were *following* on Twitter, as well as how many people were their *followers*. In survey testing it was found these were difficult numbers for participants to recall with much precision; anecdotal evidence showed that answer accuracy and confidence was low. With a free-text box respondents would often guess, and when comparing with the test participant's actual community size the numbers

[9] Sample applications include Tweetie, TweetDeck, TwitPics, Echofon, TwitterBerry, and Twitterific.

were often quite different. To reduce possible reporting errors Twitter users were asked to report community size on a 7-item ordinal scale (1 = zero, 2 = 1-50, 3 = 51 – 100, 4 = 101 – 150, 5 = 151 – 200, 6 =201 – 250, and 7 = More than 250). Testing found that 50-person buckets were most appropriate. The higher the response value, the larger the participant's *following* and/or *follower* communities.

Twitter: Shopping

To explore the role of Twitter in consumer behavior, users were asked a collection of questions about whom they were *following* on Twitter for shopping information, how frequently they post messages about products and services they were interested in purchasing or had already purchased, and how frequently they search for various types of shopping-related information.

First, Twitter users were presented with a list of seven types of shopping-related Twitter users they may be following, including brick and mortar retailers, online-only retailers, members-only shopping communities, online closeout-discounters, discount, deal and bargain sites, group discount organizers, and individual bloggers. Example web sites and services were provided for each option. This taxonomy of shopping-related Twitterers was created by searching for various types of retailers, business, and individuals providing shopping-related information on Twitter, and then categorizing those Twitterers through a card sorting methodology. The list is certainly not exhaustive, so participants were able to add types not listed. Participants' indication of which they followed was dichotomous, where 0 = not following and 1 = following.

Second, Twitter users were asked how frequently they post shopping-related messages on Twitter, both before and after purchase. Participants were presented with a list of sample message topics, such as recommendation requests and coupon codes. Due to recall issues participants were not asked to indicate how frequently they posted each of the proposed message topics; instead participants were asked to indicate how frequently they "post a message on Twitter about something (they're) interested in buying" and how frequently they "post a message on Twitter about something (they've) purchased". Shopping-related message posting frequency was indicated on a 7-item ordinal frequency scale (1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day). The higher the response value, the more frequently the participant posted that type of shopping-related message on Twitter.

Third, Twitter users were asked what type of shopping related information they search for on Twitter. To improve recall, participants were shown a list of types of shopping-related information, including recommendations, reviews, coupon or discount codes, product/service price, invitation to a members-only shopping community, information about a sale or promotion, product information, and product availability. An example was provided for each type, such as “a recommendation for a local restaurant” and “a coupon code for free shipping at an online retailer”. Readers may wonder why “invitations to members-only shopping communities” was included. These communities often limit and restrict membership to promote exclusivity, such that one can only join after receiving an invitation from an existing member. Previous work in this broader investigation found anecdotal evidence that people search Twitter for these invitations [7]. This list of information types was gathered by card sorting various types of shopping-type information found by the researcher on Twitter. The list is not exhaustive, so participants were able to add types of information not listed. Participants’ indication of which information types that had ever searched for on Twitter was dichotomous, where 0 = no and 1 = yes.

Sociodemographic Measures

Respondents reported their age, gender, education level, income level, and community type. Age was indicated on an 11-item ordinal list (1 = 18-24, 2 = 25-29, 3 = 30-34, 4= 35-39, 5 = 40-44, 6 = 45-49, 7 = 50-54, 8 = 55-59, 9 = 60-64, 10 = 65-70, 11= 70+). Gender was indicated as a dichotomous choice (female/male) was recorded as 0 = female and 1 = male. Education level was recorded on a 7-item ordinal scale (1 = Less than high school, 2 = High school, 3 = Some college, 4 = College degree, 5 = Some graduate, 6 = Graduate degree, 7 = Doctoral degree). Income level was recorded on a 6-item ordinal scale (1 = < $25,000, 2 =

$25,000 - $34,999, 3 = $35,000 - $49,999, 4 = $50,000 - $74,999, 5 = $75,00 - $99,999, 6 = $100,000+) Community type was recorded on a 3-item ordinal scale, where the higher the value the more rural a community (1 = urban, 2 = suburban, 3 = rural).

Results

Analysis

Survey data was analyzed with IBM's SPSS 18 statistics software. Analysis included generating descriptive frequencies and means comparisons. Sociodemographics were analyzed by comparing means, though gender was analyzed via chi-squared test. Independent sample t-tests were used to identify possible associations between Twitter use and a number of variables, including sociodemographics, Internet use, shopping motivations, and attitudes towards advertisements.

Sociodemographics

Participants in the sample skewed significantly female, with 74% of respondents identifying themselves as such. Possible explanations include the recruiting venue; perhaps more women frequent the community volunteer section of Craigslist. Additionally, language in the recruiting message used the word *shopping*, which may have gendered connotations versus similar words such as *purchasing* or *buying*. Twitter use has a borderline positive association with reported gender ($t = -2.2$, $p = 0.034$).

Participants reported a mean age of 3.37 (between 30-34 and 35-39), with users reporting a marginally younger age and non-users older age (3.36 and 3.39 respectively). There was no association between Twitter use and age. Participants were quite educated (mean = 4.23, between *College degree* and *Some graduate*), with users being a bit more so (4.23) than non-users (4.17). Again, there was no significant association between Twitter use and education. There was a significant association between Twitter use and reported income ($t = -3.23$, $p = 0.001$). Users reported a mean income of 3.04 ($35,000 - $49,999) while non-users reported a mean income of 2.47 (between <$25,000 and $34,999). There was a very slight association between Twitter use and reported community. ($t = 1.66$, $p = 0.099$). Users reported a mean community of 1.46 (between *urban* and *suburban*), while non-users were slightly more suburban 1.56.

Table A: Sociodemographics

Variable	Non-Twitter Users		Twitter Users		Total Population	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Male	0.21 (0.41)	211	0.31 (0.46)	186	0.26 (0.44)	397
Age	3.39 (2.47)	223	3.36 (2.46)	194	3.37 (2.46)	419
Education	4.17 (1.37)	220	4.30 (1.40)	194	4.23 (1.38)	414
Income	2.47 (1.57)	195	3.04 (1.81)***	171	2.73 (1.71)	366
Community	1.56 (0.61)	216	1.46 (0.58)^	188	1.51 (0.60)	404

Age: 1 = 18-24, 2 = 25-29, 3 = 30-34, 4= 35-39, 5 = 40-44, 6 = 45-49, 7 = 50-54, 8 = 55-59, 9 = 60-64, 10 = 65-70, 11 = 70+). **Education**: 1 = Less than high school, 2 = High school, 3 = Some college, 4 = College degree, 5 = Some graduate, 6 = Graduate degree, 7 = Doctoral degree. **Income**: 1 = < $25,000, 2 = $25,000 - $34,999, 3 = $35,000 - $49,999, 4 = $50,000 - $74,999, 5 = $75,00 - $99,999, 6 = $100,000+). **Community**: 1 = urban, 2= suburban, 3 = rural

*** p ≤ 0.001. ** p ≤ 0.01. * p ≤ 0.05. ^ p ≤ 0.1.

Internet Usage

Participants are very frequent users of Internet services and systems, in particular search engines and social networking sites. Twitter use is positively associated with frequent use of social networking sites ($t = -5.7$, $p < .001$) and review and recommendation sites ($t = -5.7$, $p < .001$). Not surprisingly, Twitter use is also positively associated with frequent use of microblogging sites ($t = -19.1$, $p < .001$), including Foursquare, Blippy, and Gowalla. Twitter use is positively associated with frequent use of shopping sites ($t = -2.8$, $p < .01$). There is no significant association between Twitter use and frequency of search engine and classified advertising site use. Not surprisingly given the survey promotion venue, frequent use of classified advertising sites was relative high for both groups.

Table B: Use of Internet Services & Systems

Variable	**Non-Twitter Users**		**Twitter Users**		**Total Population**	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Search engines (such as Google, Bing, Yahoo)	6.40 (1.01)	223	6.54 (0.78)	194	6.46 (0.91)	417
Social networking sites (such as Facebook, LinkedIn, and MySpace)	4.95 (2.1)	223	5.97 (1.46)***	194	5.43 (1.89)	417
Microblogging services (such as Twitter, Blippy, Foursquare)	1.45 (1.12)	224	4.48 (2.05)***	193	2.85 (2.22)	417
Shopping sites (such as Amazon.com, Walmart.com)	3.68 (1.55)	223	4.11 (1.57)**	194	3.88 (1.57)	417
Review & recommendation sites (such as C/Net, Yelp)	2.65 (1.67)	219	3.64 (1.86)***	193	3.11 (1.83)	412
Classified ad sites (such as Craigslist.org)	5.26 (1.50)	223	5.32 (1.55)	193	5.29 (1.52)	416

Scale: 1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day

*** $p \leq 0.001$. ** $p \leq 0.01$. * $p \leq 0.05$. ^ $p \leq 0.1$.

Twitter Usage

46.5% of participants identified themselves as Twitter users. Their accounts are largely public (65%), and most participants are relatively new users. The mean length of Twitter use is 3.05 (*6-12 months*, N = 194, SD = 1.47). Few report using Twitter more than 3 years; approximately the amount of time the service has been available.

Participants most frequently access Twitter via a web browser (mean = 4.19), while other methods are less frequent. All other access methods, SMS, third party applications, mobile browsers, and mobile third party applications returned a mean frequency between 2.26 and 2.73 (between *less than a few times a month* and *a few times a month*). As discussed earlier, the phrasing of *third party* may have impacted how participants responded to this question.

Table C: Twitter Access Methods

Access Method	Mean (SD)	N
SMS (short message service)	2.62 (2.22)	193
Web Browser	4.19 (2.09)	193
Third Party Application	2.67 (2.24)	193
Mobile Browser	2.73 (2.31)	194
Mobile Third Party Application	2.62 (2.30)	193

Scale: 1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day

Understandably, *reading* messages is the most frequent use of Twitter, with a mean response of 4.41 (between *every week* and *a few times a week*). Posting is somewhat less frequent, with a mean response of 3.82 (between *a few times a month* and *every week*). Replying to a message is less frequent (mean = 3.49), as is re-tweeting a message (mean = 3.31), and sending a direct message (mean = 3.05). Nearly three-quarters of Twitter users reported having searched Twitter for any type of information at some point. However looking more closely at the numbers few report searching Twitter with great frequency. Participants' mean frequency for searching Twitter was 4.05 (*every week)* with N = 140 and standard deviation of 1.83. In comparison, these same Twitter users reported a mean frequency for searching search engines of 6.54 (between *every day* and *a few times a day*). Nearly 50 users were *unsure* how often they search Twitter.

Table D: Twitter Usage

Activity	Mean (SD)	N
Read messages	4.41 (2.14)	195
Re-tweet a message	3.31 (2.14)	193
Post a message	3.82 (2.02)	194
Reply to a message	3.49 (2.09)	194
Send a direct message	3.05 (2.09)	194
Search Twitter	4.05 (1.83)	140

Scale: 1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day

This finding raises a question that is gaining attention in the research community, *what is search on Twitter?* Search in the traditional search engine sense involves entering keywords into a text box, pressing a button, and viewing the results. "Searching" Twitter also occurs when a user clicks a hashtag, which when using Twitter on a web browser returns messages containing that hashtag. A similar result occurs when the user clicks a user name; messages about that user are displayed. Early drafts of this survey included questions about searching Twitter via hashtags, however few participants in the pilot groups were familiar enough with these terms to respond confidently and accurately, thus the questions were omitted.

The questions in this survey did not explore *why* participants search Twitter so infrequently, though participants in the researcher's previous work in this space cited various reasons [7]. Twitter orders search results by time and keyword match, unlike a traditional search engine that uses relevance and other factors. Participants in these earlier studies expressed frustration navigating such results, and largely abandoned the practice. The broader question to be explored in future work is trying to understand *how* users search Twitter, whether it is via keywords or clicking on hashtags and user names. Such a study could be conducted by examining search logs, as well as through observing users as they search for information on Twitter.

Twitter users had a similar-sized follower and following communities; on the small side of the scale, with a shared mean response of 3.10 (51-100). As was found during survey testing, participants may have had a difficult time reporting this figure accurately and confidently. Users were not prompted to log into their personal Twitter account and check, as has been done for other Twitter studies [22]. Such an instruction was considered, however survey abandonment was a concern. A larger percentage of participants reported being unsure about their answer to this question than any other Twitter-related question.

Table E: Twitter Follower & Following Communities

Twitter Community	Mean (SD)	N
Followers	3.10 (1.70)	188
Following	3.10 (1.62)	187

Scale: 1 = zero/none, 2 = 1-50, 3 = 51 – 100, 4 = 101 – 150, 5 = 151 – 200, 6 =201 – 250, 7 = More than 250.

RQ1: Twitter & Everyday Consumer Activities

The primary goal and question for this study focuses on describing how consumers are using real-time microblogging systems such as Twitter as part of their everyday shopping activities. This study proposes three key ways: following others for shopping-related information, searching for shopping-related information, and posting information about personal consumer activities.

Following Shopping-type Twitterers

Consumers incorporate Twitter into their everyday activities by following shopping-related Twitter users for information. As detailed earlier Twitter users were asked what type of shopping-related users they were following on Twitter. Participants reported following all of the listed types of shopping Twitter users, as well as provided examples of other types of shopping-related users they were following.

Table F: Percent of Users Following Shopping-type Twitterers

Twitter User Type	Percent of Users (N = 195)
Online-only retailers (such as Amazon.com)	30.8%
Brick & mortar retailers (such as The Gap, Dell Computer, Banana Republic, H&M, Nordstrom, Wal-Mart)	29.7%
Bloggers (who talk about and review products)	25.1%
Group discount organizers (such as Groupon)	21.0%
Discount, deals, and bargain sites (such as Slickdeals, TechBargains)	18.5%
Members-only shopping communities (such as ideeli, Gilt Groupe, Rue La La)	16.4%
Online closeout/discounters (such as Woot)	16.4%

While none of the presented shopping-related users were followed by a majority of Twitter users, nearly one third cited following either brick and mortar and online-only retailers. Fewer participants reported following members-only shopping community and discount-oriented Twitter users. Looking at why brick and mortar and online-only retailers were more prevalent, one could speculate that users are more familiar with these brand names through their offline and online consumer experiences. Additionally, these online and brick and mortar retailers have recently begun including their Twitter user names in their more traditional television, print, and online advertising. While members-only communities and discount sites are gaining attention in the press, they may still be relatively unknown in the broader Internet user community. Of note is the prominence of bloggers in the consumer experience, who are second to brick and mortar and online-only retailers in percentage of participants following them.

Searching for Shopping-type Information

As discussed earlier, searching Twitter was found to be somewhat frequent for participants (mean = 4.05, *weekly*). It is valuable to know what types of information Twitter users are searching for, so users were asked to report if they had ever searched Twitter for any among a list of shopping-related types of information. Responses to this question were largely mixed, with no single type of shopping-related information emerging as most commonly searched.

Table G: Percent of Users that Indicated They Searched for Types of Shopping Information

Information Type	Percent of Twitter Users (N = 195)
Recommendation (such as where to go for dinner, or what to buy)	28.2%
Review (of a product or service)	27.2%
A coupon or discount code	26.7%
Information about a sale or promotion	24.6%
Product specifications	23.6%
The price of something	17.9%
Product availability (such as concert or sporting event tickets)	10.8%
Invitation to a members-only shopping community	8.7%

Given that Twitter positions itself as so timeliness-oriented by prompting users to share *"What's happening?"*, one could speculate that searching for time-sensitive shopping information would be commonly cited, however that was not the case for participants. Such time-sensitive information could include product availability, coupon and discount codes, and information about sales and promotions. Few reported searching for these types of time-sensitive information.

Posting about Personal Consumer Activities

Much consumer activity offline occurs through discussing our possible and recent purchases with others in social settings [3]. To explore whether such interaction occurs on Twitter, participants were asked to report how frequently they post messages about things they are interesting in purchasing or have recently purchased.

Table H: Shopping-related Twitter Posting

Activity	Mean (SD)	N
Post a message	3.82 (2.02)	194
Post about a future purchase	2.84 (2.01)	164
Post about recent purchase	2.78 (1.88)	165

Scale: 1 = Never, 2 = Less than a few times a month, 3 = A few times a month, 4 = Every week, 5 =A few times a week, 6 = Every day, 7 = A few times a day

While participants reported posting messages with some frequency (mean = 3.82), they reported posting shopping-related messages with less frequency. Participants reported posting more frequently about things they *plan* to purchase (mean = 2.84) than things that have already purchased (mean = 2.78), though not significantly. Multiple reasons could explain this general infrequency, including a reluctance to seem boastful about recent purchases or engage a broad community in a discussion about such a personal matter. In the offline world such comments are often fleeting and with a limited audience, however on Twitter those same comments are often permanent. For those users with public accounts, these comments can be viewed by anyone. Private account holders' comments are limited to their follower community, but still relatively public. Perhaps individuals post messages about planned purchases in order to field comments and recommendations from others. These proposed reasons are speculation, as participants were not asked for their motivations for posting such messages. Such nuanced and specific motivations may be better gathered through ethnographically inspired interviews with Twitter users.

RQ2: Participant Attitudes Towards Shopping Motivations and Advertisements

The secondary goal for this study is comparing Twitter users' and non-users' shopping motivations and attitudes towards advertisements. By understanding these critical components to consumer behavior we can better propose how individuals may perceive and use Twitter and similar real-time systems as part of their everyday consumer activities.

RQ2.1: Twitter Users' and Non-Users' Shopping Motivations

Participants' shopping motivations were assessed by analyzing responses to a collection of attitudinal statements first proposed in Westbrook and Black's study of consumer shopping motivation typologies [41]. This study did not seek to confirm or challenge their findings, but rather apply their shopping motivation framework to Twitter users and non-users. Responses to the survey questions are detailed in the table below.

Table I: Participant Responses to Shopping Motivations

Motivation Statement (variable)	Non-Twitter Users		Twitter Users		Total Population	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
I enjoy being one of the first to have the latest in new fashions or new products.	3.41 (1.82)	223	4.50 (1.92)***	195	3.92 (1.94)	418
I enjoy comparison shopping to find the best product for my money.	5.54 (1.45)	223	5.79 (1.32)^	195	5.66 (1.39)	418
I enjoy hunting for and finding a bargain.	5.71 (1.49)	223	5.90 (1.27)	195	5.80 (1.39)	418
I like to bargain with a salesperson for a discount.	3.53 (1.94)	223	3.90 (2.06)^	195	3.71 (2.00)	418
I like finding exactly what I want, in the least amount of time.	5.32 (1.69)	222	5.50 (1.49)	194	5.40 (1.60)	416
I enjoy shopping with friends as a social occasion.	4.06 (1.97)	223	4.84 (1.82)***	195	4.43 (1.94)	418
I enjoy being waited on by a salesperson who is anxious to please.	3.60 (1.84)	223	4.22 (1.97)***	195	3.89 (1.92)	418
I enjoy just looking around at interesting store displays.	5.04 (1.70)	223	5.33 (1.52)^	195	5.18 (1.62)	418

All statements used the following 7-item Likert-style scale: 1 = Strongly disagree, 2 = Disagree, 3 = Slightly disagree, 4 = Neither disagree or agree, 5 = Slightly agree, 6 = Agree, 7 = Strongly agree.

*** $p \leq 0.001$. ** $p \leq 0.01$. * $p \leq 0.05$. ^ $p \leq 0.1$.

The data shows that Twitter users have somewhat different shopping motivations than non-users. Twitter users reported higher motivations across the board for all of Westbrook and Black's proposed shopping motivation statements [41]. Recall that Twitter use is strongly associated with frequent use of shopping-related web sites ($t = -2.8$, $p = .006$).

Twitter use is positively associated with being motivated to shop in order to have the "latest in new fashions or products" ($t = -6.0$, $p < .001$). Given Twitter is still a relatively new technology we could speculate that these individuals are *early adopters* of new things [28]. Twitter use is positively associated with enjoying comparison shopping ($t = -1.8$, $p = .07$) and bargaining with salespeople ($t = -1.9$, $p = .06$), however the effect is borderline significant. Of all shopping motivations presented, bargaining with a salesperson for a discount was either the lowest-cited or second lowest-cited motivation for shopping. Such a finding is not surprising, since bargaining is not common in the United States unless one is shopping for automobile or house, or shopping at a flea market or similar venue [34].

Twitter us is positively associated with enjoying shopping with friends as a social occasion ($t = -4.2$, $p < .001$). We could speculate that Twitter users are a more social group than non-users, particularly with Twitter being categorized as a *social* media system. Recall that Twitter use is positively associated with frequent use of social networking sites ($t = -5.7$, $p \leq .001$). Previous unpublished work by the researcher found that consumers in an offline shopping space often turn to sending photographs and text messages to friends in order to field comments and ideas. Perhaps users are turning to Twitter to complement their otherwise solo online shopping experiences, using it as a means to engage others just as they would in the brick and mortar shopping space.

Twitter use is positively associated with enjoying being "waited on by a salesperson who is anxious to please" ($t = -3.3$, $p \leq .001$). While this question was originally intended for the traditional offline shopping experience, it has possible implications for the online experience, particularly with respect to personalized services. In recent years numerous retailers' web sites, including Patagonia[10] and eBags[11] have begun offering personalized one on one text chat to assist consumers on their web sites. A consumer visiting the site is shown a small chat window, where a salesperson is available to answer questions. Major retailer Best Buy recently introduced *twelpforce*, a team of customer service employees who

[10] Patagonia. http://www.patagonia.com
[11] eBags. http://www.ebags.com

field and respond to customers' inquiries on Twitter.[12] If Twitter users are looking for more personalized service from companies, the channels itself provides one means to offer such services.

Lastly, Twitter use is borderline positively associated with enjoying looking at interesting store displays ($t = -1.9$, $p = .07$). In Westbrook and Black's study this question was amongst those exploring the *stimulation* motivation. The question was not reframed into a neutral online-offline shopping statement, as equivalent online version did not become apparent during survey testing. Perhaps Twitter provides these users with some form of visual stimulation, similar to what one would experience with brick and mortar retail displays.

RQ2.2: Twitter Users' and Non-Users' Attitudes towards Advertisements

Participants' attitudes towards advertisements were assessed by analyzing responses to a group of attitudinal statements excised from Schlosser's study of attitudes about Internet advertising [31]. As with the shopping framework, this study did not seek to confirm or challenge their findings, but rather apply their well-cited findings to the Twitter user community. Responses to the survey questions are detailed in the table below.

[12] Best Buy Twelpforce. http://www.twitter.com/twelpforce

Table J: Participant Attitudes Towards Advertisements

Attitude Statement (variable)	Non-Twitter Users		Twitter Users		Total Population	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
In general, I like advertising.	3.79 (1.68)	224	4.20 (1.73)*	195	3.98 (1.74)	419
Most advertising is informative.	3.83 (1.57)	224	4.02 (1.63)	195	3.92 (1.60)	419
I often use advertising to help make purchase decisions.	3.76 (1.62)	224	4.20 (1.68)**	195	3.96 (1.66)	419
In general, I feel confident using information I see in an advertisement to make a purchase decision.	3.63 (1.64)	224	3.97 (1.74)*	195	3.79 (1.70)	419
Most advertisements insult my intelligence.	4.24 (1.69)	224	4.34 (1.67)	195	4.29 (1.68)	419
In general, I feel I can trust advertising.	3.17 (1.53)	224	3.76 (1.76)***	195	3.44 (1.67)	419
In general, advertising results in lower prices for the products I buy.	3.50 (1.56)	224	3.84 (1.75)*	195	3.65 (1.67)	419
I think the government should put less effort into regulating the content of advertising I can see.	3.75 (1.53)	223	3.75 (1.76)^	195	3.88 (1.65)	418

All statements used the following 7-item Likert-style scale: 1 = Strongly disagree, 2 = Disagree, 3 = Slightly disagree, 4 = Neither disagree or agree, 5 = Slightly agree, 6 = Agree, 7 = Strongly agree.

*** $p \leq 0.001$. ** $p \leq 0.01$. * $p \leq 0.05$. ^ $p \leq 0.1$.

First, it should be recognized that across the board both users and non-users have a somewhat negative view of advertising, with nearly every statement returning a mean response less than 4 (*neither agree or disagree*). This finding is consistent with previous studies of consumer attitudes towards advertising [31][33][40].

Twitter use is positively associated with a more favorable attitude towards advertisements, particularly *liking* advertisements ($t = -2.5$, $p = .014$), though the effect is borderline significant. According to previous studies, individuals with higher incomes generally hold less favorable views of advertisements than those with lower incomes [32]. Twitter users in this sample reported higher incomes than non-users. Perhaps Twitter users have a more favorable view because they feel they have greater control over the advertisements they see, at least on Twitter. Until recently a user must actively choose to follow someone in order to receive their advertising-type messages. There is no significant association between Twitter use and whether one finds advertising informative ($t = -1.24$, $p = 0.22$).

Looking at possible relationships between advertising and purchasing, Twitter use is positively associated with using advertising to help make purchase decisions ($t = -2.7$, $p < .01$). Studies have found that advertising plays a critical role in purchasing decisions, providing information about brands, products, features, and prices [25]. Perhaps Twitter users rely on advertisements to stay abreast of the latest products and services, thus priming them for future purchase decisions. With their higher incomes, perhaps Twitter users are more open to viewing advertisements promoting products and services that they may be able to actually purchase. Perhaps non-users and their lower incomes are annoyed by such advertisements, since they do not have the financial means to purchase the advertised products.

Twitter use is positively associated with confidence in using the information in advertisements to help guide purchase decisions ($t = -2.1$, $p = .04$), though the effect is borderline significant. We must be careful to not construe this single result to mean they are more trusting of advertisements than non-users; fortunately a trust-focused question was also asked. Twitter use is positively associated with trust of advertising in general ($t = -3.7$, $p < .001$). Note that users are still somewhat distrustful of advertising (mean = 3.8). Perhaps users are better able than non-users to discern which information in advertisements is most effective for guiding their purchase decisions.

Twitter use is positively associated with believing that advertising results in lower prices for products ($t = -2.1$, $p = .04$), though the effect is borderline significant. Additionally, Twitter use is borderline positively associated with thinking the government should put less effort into regulating advertising content ($t = -1.7$, $p = .09$). Both Twitter users and non-users agreed that advertisements insult their intelligence ($t = -0.6$, $p = 0.6$), which is consistent with general studies of advertising attitudes [33]. Both groups reported a stronger agreement with this statement than any other on advertising (mean = 4.3). It is unclear from the data what types of advertisements are most insulting, or through via what channels those advertisements are consumed. Such a sentiment poses challenges for advertisers and advertising networks; do they risk offering more intelligent, less-insulting advertisements?

Limitations

This research is limited by several factors. First, recruiting participants through Craigslist community volunteer sites limits the population to those that frequent those sites, which may be less representative of the entire domestic Internet population. While compensation was nominal and randomly distributed, participants may have been more or less compelled to participate based on the compensation offered. The distribution of male and female participants may indicate that recruiting messages presented a gendered tone; perhaps more males would have responded if terms such as *buying* and *purchasing* were used instead of *shopping*. Males pursue consumer activities, however they may have been less compelled to view and complete the survey advertisement given the language used. The study relied on participants recalling their behavior and activities, and participants may have difficulty remembering their activities, and may have tried to present themselves in an ideal manner. The survey relied on a set of attitudinal questions that may not encompass all participants' relevant views and opinions. Lastly, these results do not indicate causal relationships; the findings are presented and intended as associational relationships between various variables. Given these limitations, this study still provides valuable insights into Twitter users' and non-users' consumer behavior and attitudes, and provides a framework for future studies.

Discussion & Implications

These findings have implications for the emerging role of advertising on Twitter. Knowing that Twitter use is positively associated with liking advertisements, having confidence in using advertising to guide purchasing decisions, and having trust in advertisements raises questions about how consumers may respond to advertisements on Twitter. Twitter users still held a somewhat negative view of advertising: perhaps such views will transfer to these new advertisements, or these new advertisements will better engage consumers and overcome this sentiment, at least on Twitter.

RQ3: Implications for Consumer Behavior on Twitter

Since its inception in late 2006 until recently the Twitter user experience has existed without a formal advertising system, as a user would experience using other online services such as search engines and social networking sites. This advertising system-free experience continued until mid-April 2010, just after this survey completed. At the company's first developer conference it announced a new system for introducing advertisements to the Twitter user experience [36]. This study was conducted prior to such changes, allowing us to gain insight into consumer attitudes, opinions, and behaviors in this advertising system environment. Researchers can then compare these findings with those from post-advertising system deployment studies. Additionally this study allows us to propose how users may respond to the advertising system as it evolves. Prior to diving into an examination of the advertising system, it is valuable to briefly review two elementary advertising methods and how they relate to Twitter.

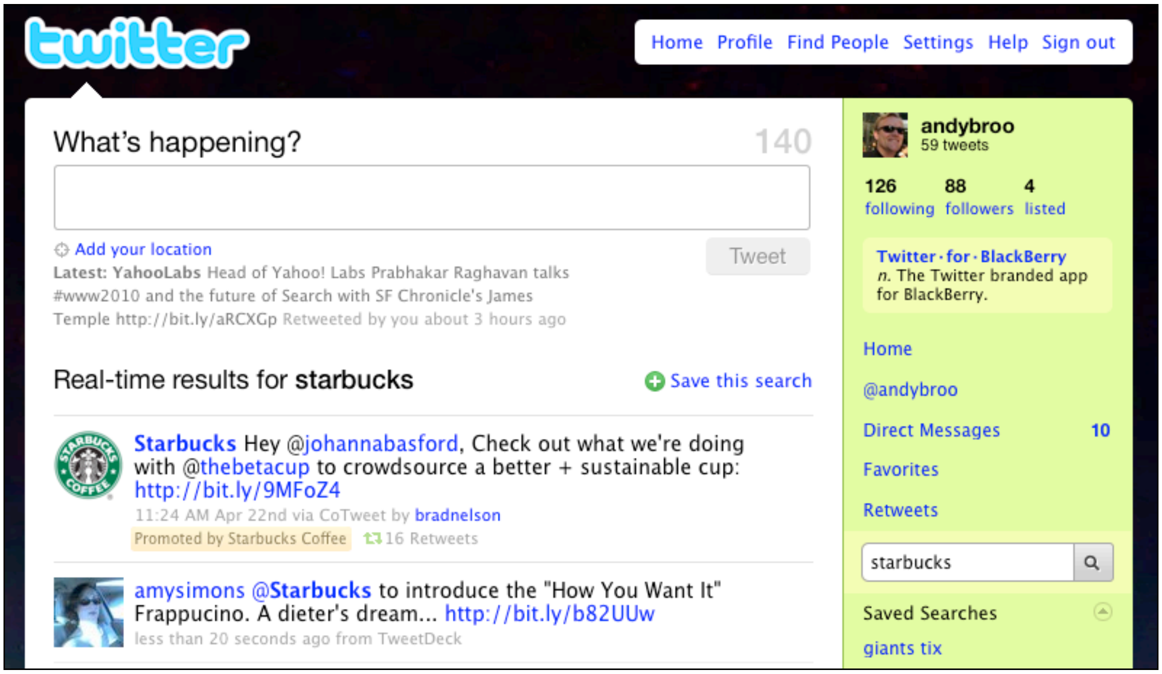
Advertising often relies on two methods of distributing information about a brand, product, or message: *push* and *pull*. In push-oriented marketing advertisers direct, or *push*, their messages towards consumers who may or may not be aware of their brand, product, or message being advertised. In pull-oriented marketing advertisers rely on consumers to know something about their brand, product, or message, and then actively seek out, or *pull* more information to them in the form of advertisements. These are two very different approaches to advertising, and some brands exhibit greater success than others.

Prior to the launch of its advertising system, Twitter was almost entirely a *pull*-oriented advertising environment. The only way a user could receive advertisement-type messages from another Twitter user was through choosing to follow that user. For example, a user could actively choose to follow Dell Computer[13] in order to receive promotions, or someone the user is following could re-tweet a Dell Computer promotion she viewed by following Dell Computer herself. Advertisers could *push* advertisements, however users would not see them unless they chose to *pull* those advertisements towards themselves. Users controlled this relationship; however this model changes with the introduction of Twitter's advertising system.

Twitter is introducing advertisements to its user experience through phases. Phase one focuses entirely on the *user* search experience, while subsequent phases will likely focus on users' message timelines. In phase one when a registered Twitter user enters a keyword into Twitter's search box or clicks on a trending topic, she is shown a list of matching keyword search results sorted by time. The first position in the search results may be a Promoted Tweet, a new message type introduced by Twitter. The message may be slightly older than other messages in the search results, however the advertiser has marked it has a promoted message, which they pay some amount for, and the message resonates with users. The message is visually identified as a Promoted Tweet with a subtle "Promoted by <advertiser name>" text indication on a yellowish background. See Figure A: Twitter Keyword Search Advertising Experience, Phase 1 for a sample of the user experience when searching for "Starbucks".

[13] Dell Outlet. http://www.twitter.com/DellOutlet

Figure A: Twitter Keyword Search Advertising Experience, Phase 1



"Resonance" is an algorithm designed and named by Twitter to identify which messages have particular value and relevance for users.[14] Similar to Google's PageRank algorithm, Resonance relies on more than simple keyword matching relevancy to order search results [26]. Twitter has not detailed all of the components making up Resonance, but it has acknowledged that factors include keyword search match and how users interact with the message. Central to Twitter's advertising system is the notion that a Promoted Tweet is just like another message on Twitter; only the original poster-advertiser has promoted it for Resonance candidacy. Users must reply, re-tweet, and interact with the message in various ways before it will achieve enough Resonance and appear at the top of a search results page as a Promoted Tweet. Additionally, the advertiser must bid for the Promoted Tweet position, as the search results only display one Promoted Tweet. Users are now experiencing phase one of the advertising system when searching Twitter.

Phase one represents a shift from entirely *pull*-oriented advertising to one now incorporating minor *push* components. By marking a message as a Promoted Tweet, an

[14] Twitter FAQ: Advertisers: http://help.twitter.com/entries/142161-faq-advertisers

advertiser is asserting an interest in *pushing* that message towards users. The advertiser must still wait for the user to *pull* the Promoted Tweet towards himself through keyword search. Advertising on Twitter will tilt more towards a *push* model when the advertising system inserts Promoted Tweets into user message timelines. To do so Twitter may examine a user's past messages, both they posted and read, replied to, and re-tweeted, as well as their follower and following community and then insert Promoted Tweets that have Resonance. The user will no longer have to explicitly *pull* messages towards herself through keyword search; advertisers will *push* these messages to her, and she will implicitly and explicitly *pull* them towards herself through her everyday Twitter activities.

With this understanding of Twitter's advertising system we turn to possible implications for consumer behavior on Twitter. Implications are significant for the current phase of, and much more so for Twitter's proposed phases that introduce Promoted Tweets to users' message timelines. We first consider implications for keyword search, and as well as examine possible implications for Promoted Tweets inserted in messages timelines.

Many users will likely not notice Twitter's advertising system as implemented in phase one, since keyword search is infrequent While Twitter reports significant search volume (600 million per month)[43], its search site does not register on comScore's list of heavily trafficked web sites [12]. It is widely thought that Twitter's figure represents mostly automated search via its APIs (application programming interfaces), and not individual users searching the site. Supporting that claim, users in this study reported searching Twitter roughly a few times a month (mean = 3.20). In comparison, these same Twitter users reported using search engines between every day and a few times a day (mean = 6.54). At this point the advertising system will likely not have a significant immediate impact on broad consumer behavior on Twitter, since it is largely hidden from most users' experiences. Developing an advertising system for keyword search first is an astute move, as it offers the company a means to release it to a small community of users while the company garners press and continues development. For those users who search Twitter and experience the advertising system, it has an opportunity to improve their trust in advertisements, and better provide the information they need to make purchase decisions. These implications will carryover to phases that introduce Promoted Tweets to users' message timelines.

As found in the survey, Twitter use is associated with both liking advertising and trusting advertising in general, respectively. Recall that users still held a somewhat negative view of advertising. What distrust a user has may be tempered by *Resonance*, as it relies on other users to help identify, through replying, re-tweeting, and other activities, those advertisements of interest, value, and relevancy. As shown in Figure B: Promoted Tweet Detail, users will be able to see who and how many people re-tweeted the message-advertisement, perhaps giving it credibility and boosting trust in the advertisement, its content, and the advertiser.

Figure B: Promoted Tweet Detail

Additionally, Promoted Tweets appear to only be available from "Verified Accounts", those users whom Twitter has confirmed are who they say they are, and the users' full name is prominently displayed to the user. Such crowd-sourced validation and authentication is arguably less common in typical keyword search advertising. These assurances of trust and authenticity may result in greater action by consumers, including reading and re-tweeting, but most importantly taking action based on information in the advertisement. Consumers are more apt to positively respond to and click on Promoted Tweets than other forms of display advertisements, as they better instill trust and authenticity for users.

While keyword search-based advertisements may have implications for consumer behavior for reasons above, implications are far more pronounced for message timeline-inserted advertising. In particular, the insertion of advertisements assisting users with making purchase decisions, and advertisements which drive users to engage with their social network.

As found in the survey, Twitter use is associated with using information in advertisements to help make purchase decisions. Consider a not-too-far-off future where

Twitter is data mining users' messages and communities to identify their interests and activities. Rather than relying on users to explicitly assert interest through keyword search, users implicitly imply interest through their everyday Twitter use. Search engines such as Google and Yahoo use such data mining-like practices to identify users' interests. However traditional search engines in this instance then rely on matching users' interests with a relatively static pool of advertisements.

In such a scenario on Twitter the company is able to draw on advertisers supplying a steady stream of messages to their standard follower communities, who may then interact with those messages, generating Resonance. These timely messages will then be displayed in keyword search and inserted into appropriate user message timelines. Twitter may then be able to more rapidly anticipate and react to users' Interests, presenting them with advertisements that resonate with other users, and increasing the precision and relevancy of those advertisements. Such precision and relevancy can provide consumers with the information they need, such as product information, price, or availability, at a critical stage in the decision-making process when they need it most, perhaps leading to a purchase. This advertisement-consumer matching marketplace is significantly more fluid than found with traditional search engines.

Twitter use is strongly associated with enjoying shopping as a social occasion, and users may enjoy engaging with others in similar ways via Promoted Tweets. Advertisers could leverage the social aspect of consumer behavior, inviting users to interact with one another through posting and re-tweeting messages. While this study found that users infrequently post about things they plan to purchase or have purchased, users may be more willing to engage in a re-tweeting oriented activity since it requires less effort and may appear less as "meforming". Naaman et al. coined the term "meforming" for Twitter and social media behavior where the user primarily shares information about oneself, such as thoughts and activities, rather than sharing broadly consumable information [23].

The findings presented in this study have implications for consumer behavior on Twitter, and are timely considering its recently announced advertising system. By conducting this study before the announcement and system launch, consumers' opinions, attitudes, and behaviors were gathered in a known, stable pull-oriented advertising environment. Twitter's advertising system introduces significant changes to the user experience, essentially transforming Twitter into a hybrid push-pull advertising environment. The findings from this study imply that at first users may not notice Twitter's advertising system, yet thanks to the Resonance algorithm and others factors, once they experience the system they may be more likely to trust the advertisements they see, as well as use them as sources of information during the purchasing process, and socially engage with others about their content.

Advertisement, Product & Service Design Opportunities

The findings in this study pose implications for several domains: the design and selection of advertisements for Twitter and similar real-time communication systems, and the design of future products and services leveraging these real-time systems.

Advertisers may take advantage of these findings by targeting products and services they promote for early adopters. Advertisements should provide targeted information needed as part of the decision making process: reviews, recommendations, product features, and availability. Through a stream of contextually relevant messages with a single piece of valuable information advertisers' messages may best garner Resonance with users. For example, a concise message that links to a new product's review by a third-party, or where a sought-after product may be found. Brand-loyal users may interact with that message, boosting its *Resonance* for appearance in other users' and non-followers keyword searches about that product and review information. Advertisers should not try to achieve relevancy for *all* users and followers with every message, as it may likely dilute their efforts and result in messages not acquiring any *Resonance.*

While Twitter use was associated with trusting advertisements more than non-use, advertisers should be cautious when including shortened URLs[15] in their messages, as much as it helps fit more characters into a message. Shortened URLs pose usability challenges, as users may be reluctant to click a link they do not recognize [16]. If including shortened URLs in messages, advertisers should strive to use recognized and trusted shortened URL service providers. If users do not trust the shortened URLs in messages, they are unlikely to interact with the message through replying and re-tweeting, resulting in lower *Resonance*.

Numerous product and service design present themselves from this study. Much work as already been done in this space, including the development of third party application and services to help improve the Twitter user experience. These developments often focus on improving search and search results presentation, and helping individual users better manage the messages they consume. Lesser development attention has been

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[15] Shortened URL service providers convert long web site addresses into shortened unique addresses, which more readily fit into Twitter's 140-character limitation.

devoted to helping advertisers and businesses understand the relationship between their brands and consumers on Twitter, which has become ever more important with the introduction of Twitter's advertising system.

Similar to other online advertising systems, Twitter plans to offer advertisers a suite of tools to help them understand how consumers are interacting with their advertisements. Additional opportunities exist creating products and services that help advertisers make sense of the broader Twitter environment, as well as their vertical industry and competitors. These data mining-focused efforts can help discern brand sentiment, such as whether a new product or service is garnering positive or negative attention. Through closely monitoring Twitter's trending topics, particularly in specific geographic locations, data mining may be able to anticipate and identify emergent advertising opportunities in near real-time. Services can be developed that monitor competitors' activities, including what types of messages they post and their user community. Through analyzing competitors' follower communities and their public messages, advertisers may be able to gain deeper insight into how to convert those consumers to their products and services. Much of these proposed products and services are possible through Twitter's APIs, lowering the barrier to create such products and services.

Future Work

This study presents a number of directions for future work. As detailed, this research was limited by several factors, including the recruiting venue and the resulting sample's gender diversity, and the breadth and scope of questions that could be asked in an online survey. To overcome these limitations and enrich this study's findings the study may continue with a quantitative analysis of Twitter messages and qualitative ethnographically inspired interviews with Twitter users.

The proposed quantitative phase will further focus on examining how consumers use Twitter as part of their everyday activities. Rather than relying on users to recall how they use Twitter, participants will be solicited for permission to analyze the messages they post, re-tweet, and reply to, as well as their follower and following communities. These messages and communities will be analyzed and coded for subjects and themes. For example, counting how many advertisements a user receives and from whom, and if and when they share those advertisement-messages with others through re-tweeting. Similar methods have been used of late to understand what types of questions people ask their social networks [22].

Complementing the proposed quantitative phase, Twitter users may be interviewed to more deeply understand their use of Twitter and attitudes towards shopping motivations and advertisements. Eliciting users' personal stories will better identify why they use Twitter, and why they may have certain attitudes about shopping and advertisements. In anticipation of recruiting participants for such a qualitative phase, participants in this study were offered the opportunity to volunteer for a subsequent interview. Numerous participants volunteered for this qualitative phase and interviews may be scheduled for summer 2010.

Conclusion

Twitter and similar real-time information communication systems are changing the way we share and consume information during our everyday activities. While previous studies have examined broad use, this study presented a quantitative analysis of the role of Twitter in a specific, ubiquitous activity: consumer shopping. The study was framed as a component of a broader examination of information seeking and sharing on the Internet, and gathered data about Twitter's non-users as well. This framing made possible comparisons between Twitter users and non-users, specifically their motivations to pursue consumer activities and attitudes towards advertisements, a central driver of that activity.

While this study focused on the use of consumer-focused information on a specific real-time system, increasingly that information is being made available via other Internet services and systems. Google, Yahoo, and others are currently testing how to best integrate search results from real-time systems such as Twitter into traditional search engine results. It remains to be seen how mixing results from somewhat static and heavily dynamic information systems will impact user behavior, let alone consumer behavior. Perhaps we should first examine why users search one system instead of another, or to complement another, and if so in which sequence those systems are searched.

Ultimately the motivation for conducting this study now was to better understand the interplay of consumer behavior and real-time information systems in a focused user experience on Twitter. In short time this user experience will likely change, from the introduction of keyword search advertisements, to the convergence of real-time and traditional search results in a single experience. At such a point the questions posed in this study may become increasingly complex and more difficult to assess. This study utilized a clean, simple framework to understand two key components of consumer activity, shopping motivations and attitudes towards advertisements, for both Twitter users and non-users. The findings offer a valuable baseline to inform future studies exploring the intersection of consumer behavior and real-time systems, both in real-time and hybrid traditional and real-time information system environments.

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References

[1] Alwitt, L. F. and Prabhaker, P. R. (1994) Identifying Who Dislikes Television Advertising: Not By Demographics Alone. *Journal of Advertising Research, 34*(6), 17 - 29.

[2] Ariely, Dan. (2008). Predictably irrational: The hidden forces that shape our decisions. New York, NY, US: Harper Collins Publishers.

[3] Arnold, M. and Reynolds, K. Hedonic shopping motivations. *Journal of Retailing,* 79, 2 (2003), 77-95.

[4] Bauer, R.A. and Greyser, S.A. (1968). Advertising in America: The Consumer View. Boston: Harvard University, Graduate School of Business Administration, Division of Research.

[5] Bellenger, D. N. and Korgaonkar, P. K. Profiling the Recreational Shopper.. *Journal of Retailing, 56*(3), 77.

[6] boyd, danah, Golder, Scott, and Lotan, Gilad. (2010). Tweet Tweet Retweet: Conversational Aspects of Retweeting on Twitter. Proceedings of HICSS-43. Kauai, HI. January 5-8.

[7] Brooks, Andrew L. (2009). Internal report, Yahoo! Research.

[8] Brooks, Andrew L. (2010) Internal report, Yahoo!.

[9] Brooks, Andrew L. and Churchill, Elizabeth. (2010). (2010). "Tune in, Tweet on, and Twit out: Information Snacking on Twitter." Workshop on "Microblogging: What and How Can We Learn From It?" at ACM CHI Conference on Human Factors in Computing Systems, Atlanta, GA, April 11, 2010.

[10] Carr, David. (2010) Why Twitter Will Endure. New York Times, January 1, 2010. http://www.nytimes.com/ 2010/01/03/weekinreview/03carr.html

[11] Churchill, Elizabeth F., Ubois, Jeff. (2009) Lead type, dead type: New patterns of local news production and consumption. Ethnographic Praxis in Industry Conference. Chicago, IL.

[12] comScore. (2010). comScore Releases March 2010 U.S. Search Rankings. April 12, 2010. http://www.comScore.com/Press_Events/Press_Releases/2010/4/comScore_Releases_March_2010_U.S._Search_Engine_Rankings

[13] Craigslist.org Web Traffic Stats: Alexa http://www.alexa.com/siteinfo/craigslist.org. Accessed April 15, 2010.

[14] Eastlick, M. A. and Feinberg, R. A. (1999). Shopping Motives for Mail Catalog Shopping. *Journal of Business Research, 45*(3), 281 - 290.

[15] Fox, Susannah, Zickhur, Kathryn, and Smith, Aaron. (2009). Twitter and Status Updating, Fall 2009. Pew Internet & American Life Project. October 21, 2009. http://www.pewinternet.org/Reports/2009/17-Twitter-and-Status-Updating-Fall-2009.aspx

[16] Gilbertson, Wiliam. (2009). Why URL Shortening is a Threat to the Web. Webmonkey, Wired.com. April 6, 2009. http://www.webmonkey.com/2009/04/why_url_shortening_is_a_threat_to_the_web/

[17] Gladwell, Malcolm. (2002). The tipping point: how little things can make a big difference. New York, NY: USA. Little Brown.

[18] Honeycutt, C. and Herring, Susan C.. (2009). Beyond microblogging: Conversation and collaboration via Twitter. Proc. of the Forty-Second Hawaii Inter. Conf. on Sys. Sciences. Los Alamitos, CA. IEEE Press.

[19] Jansen, Bernard, Zhang, Mimi, Sobel, Kate, and Chowdury, Abdur. (2009). Twitter Power: Tweets as Electronic Word of Mouth. Journal of ASIS&T,60(9),1-20.

[20] Java, Akshay, Song, Xiaodan, Finin, Tim, and Tseng, Belle. (2007). Why We Twitter: Understanding the Microblogging Effect in User Intentions and Communities. WebKDD. San Jose, CA. August 12-15.

[21] Krishnamurthy, B., Gill, P., et al. (2008). A few chirps about twitter. *Proc. WOSP '08: Proceedings of the first workshop on Online social networks,* 2008. 19–24.

[22] Morris, M. R., Teevan, J., et al. (2010). What Do People Ask Their Social Networks, and Why? A Survey Study of Status Message & Behavior. *Proc. In Proceedings of CHI 2010.*

[23] Naaman, M., Boase, J., et al. (2010). Is it really about me?: message content in social awareness streams. *Proc. CSCW '10: Proceedings of the 2010 ACM conference on Computer supported cooperative work,* 2010. 189–192.

[24] Nelson, Michelle, Keum, Heejo, Yaros, Ronald. (2004). Advertainment or AdCreep? Game Players' Attitudes Towards Advertising and Product Placements in Computer Games. Journal of Interactive Advertising. Vol 5 No 1, (3-21)

[25] Nelson, P. (1974). Advertising as Information. *The Journal of Political Economy, 82*(4), 729–754.

[26] Page, L., Brin, S., Motwani, R., and Winograd, T. (1999). The PageRank Citation Ranking: Bringing Order to the Web.. Technical Report #1999-66. Stanford InfoLab. Retrieved from http://ilpubs.stanford.edu:8090/422/.

[27] Reid, R., Brown, S.. (1996). I hate shopping! An introspective perspective. International Journal of Retail & Distribution Management, 24(4) (1996) 4—16

[28] Rogers, E. M. (1962). *Diffusion of innovations*. New York: Free Press

[29] Rohm, A. J. and Swaminathan, V. (2004). A typology of online shoppers based on shopping motivations. *Journal of Business Research, 57*(7), 748 - 757.

[30] Sandhusen, Richard. L. (2000). Marketing, Third Edition. Hauppage, NY: USA. Barron's Educational Series, Inc.

[31] Schlosser, Ann E., Shavitt, Sharon, Kanfer, Alaina. (1999) Survey of Internet Users' Attitudes Towards Internet Advertising. Journal of Interactive Marketing. Volume 13, Number 3. Summer 1999. Wiley & Sons.

[32] Shamma, David A., Kennedy, Lyndon, and Churchill, Elizabeth F.. (2009). Tweet the Debates: Understanding Community Annotation of Uncollected Sources. ACM Multimedia. Beijing, China.

[33] Shavitt, S., Lowrey, P.M., and Haefner, J.E. (1998). Public Attitudes Towards Advertising: More Favorable Than You Might Think. Journal of Advertising Research, 7-22.

[34] Sherry, John F., J. (1990). A Sociocultural Analysis of a Midwestern American Flea Market. *The Journal of Consumer Research, 17*(1), 13–30.

[35] Stigler, G. J. (1954). The Early History of Empirical Studies of Consumer Behavior. *The Journal of Political Economy, 62*(2), 95–113.

[36] Stone, Biz. (2010). Twitter Blog: Hello World (2001). Posted April 13, 2010. http://blog.twitter.com/2010/04/hello-world.html

[37] Stone, G. P. (1954). City Shoppers and Urban Identification: Observations on the Social Psychology of City Life. *The American Journal of Sociology, 60*(1), 36–45.

[38] Sutton, J., Palen, Leysia, and Shlovski, Irina. (2008). Back-Channels on the Front Lines: Emerging Use of Social Media in the 2007 Southern California Wildfires. *Proceedings of 2008 ISCRAM Conference.* Washington, D.C..

[39] Tauber, Edward. (1972) Why Do People Shop?. The Journal of Marketing, Vol. 36 (4). October 1972,46-49.

[40] Tsang, M. M., Ho, S., et al. (2004). Consumer Attitudes Toward Mobile Advertising: An Empirical Study. *Int. J. Electron. Commerce, 8*(3), 65–78.

[41] Underhill, P. (2008). *Why We Buy: The Science of Shopping--Updated and Revised for the Internet, the Global Consumer, and Beyond*. Simon & Schuster.

[42] Westbrook, Robert A. and Black, William C. (1985) A motivation-based shopper typology. Journal of Retailing 61(1), 78-103.

[43] Williams, Evan. (2010). Twitter Statistics. Presentation at Twitter Chirp Developer Conference. April 14, 2010.

[44] Zhao, D. and Rosson, M. B. (2009). How and why people Twitter: the role that micro-blogging plays in informal communication at work. *Proc. GROUP '09: Proceedings of the ACM 2009 international conference on Supporting group work,* 2009. 243–252.