

RSS Feeds, Browsing and End-User Engagement

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ABSTRACT

Despite the vast amount of research that has been devoted separately to the topics of browsing and Really Simple Syndication (RSS) aggregation architecture, little is known about how end-users engage with RSS feeds and how they browse while using a feed aggregate. This study explores the browsing behaviors end-users exhibit when using RSS and Atom feeds. The researcher analyzed end-users' browsing experiences and discusses browsing variations. The researcher observed, tested, and interviewed eighteen (N=18) undergraduate students at the University of Tennessee to determine how end-users engage with RSS feeds.

This study evaluates browsing using two variations of tasks, (1) an implicit task with no final goal and (2) an explicit task with a final goal. The researcher observed the participants complete the two tasks and conducted exit interviews, which addressed the end-users' experiences with Google Reader and provided further explanation of browsing behaviors. The researcher analyzed the browsing behaviors based upon Bates' (2007) definitions and characteristics of browsing. The results of this exploratory research provide insights into end-user interaction with RSS feeds.

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CHAPTER 1: INTRODUCTION

1.1 Problem Statement and Introduction

The publishing-subscribe (pub-sub) paradigm for sending and receiving electronic content is a popular resource used by information agencies and end-users to access constant streams of current and up-to-date published information. Feed aggregates allow users to specify the publications and feeds they wish to receive. Many studies have evaluated the technical software and hardware architecture design issues related to feed aggregators. However, there has been limited research on how subscribers interact with the online content once published. Studies researching end-user behaviors (e.g., how end-users or subscribers filter, comprehend, use and incorporate information received from Really Simple Syndication (RSS) or Atom items) are few. Understanding why end-users engage with aggregates and what feed or item characteristics promote their engagement would augment understanding of end-users' information retrieval habits and could lead to systems modifications that appeal to users' aesthetics. If systems architects and designers clearly understand the end-user requirements of systems that push electronic content to end-users, they could construct systems that are more engaging and in tune with user needs.

Insights gained from evaluating the behaviors of end-users would be valuable for information scientists, human computer interaction specialists and systems developers who seek to understand user engagement with published and pushed online content. Web developers have worked with syndicating web content in the form of RSS feed aggregators and their variants since 1999. Although aggregators of online content have been available for over a decade, it was not until 2005 – 2006 that standardization in RSS compatibility and markup was addressed and greatly improved (Paulson, 2004 and Liu *et al.*, 2005). Improvements to the standards allowed

for further adoption of RSS aggregators. Tools for gathering online content have become increasingly popular resources among end-users. This rise in popularity has led to further innovation, including the addition of Atom feeds, an alternative to the standard RSS feed. Atom is a robust syndication standard that has advanced the retrieval of online materials from user-specified sites.

By using the feed aggregator or feed reading, the end-user is presented with a standardized format to access the desired source (e.g., The New York Times or Wired). The feeder automatically refreshes the content and collects the latest published materials until read or deleted by the user. If a site publishes content as an RSS or an Atom feed, the user can access the article's headline and link to the original story. Content management systems and web standards allow countless websites to be added to a feed reader and receive updates.

The phrase "user engagement" defines the level of interaction and cognitive and affective responses that an end-user exhibits when using a technology (O'Brien and Toms, 2008). Analysis of how end-users engage with any system remains an area of research that is continuing to evolve as systems developers focus on what end-users want from their computer applications and systems. This exploratory study proposes to observe and examine the browsing behaviors and the affective reactions that the end-users exhibit while using RSS and Atom feed readers. By evaluating how end-users are engaging with RSS and Atom feeds, the researcher will fill a gap that currently exists in information behaviors studies.

1.2 Definitions

The researcher has developed working definitions for the terms, variables and concepts that are involved in this exploratory study. Throughout the course of this exploration into

browsing behaviors and end-user engagement, the operational definitions may continue to evolve into fuller, more comprehensive and definite terms and concepts.

Atom feed – a XML standard similar to RSS. Atom feeds represent the next generation of standardized pub-sub syndication. Like RSS, Atom feeds contain metadata related to the original source’s content and is published to an end-users’ feed aggregation client.¹

Browsing – an end-user behavior characterized by accessing a site via an Internet browser and navigating across sites and viewing site content. It is “an activity of engaging in a series of glimpses, each of which exposes the browser to objects of potential interest; depending on interest, the browser may or may not examine more closely one or more of the (physical or represented) objects; this examination, depending on interest, may or may not lead the browser to (physically or conceptually) acquire the object” (Bates, 2007, p. 14).

Infrequent end-user – a person who engages with the computer application and would be defined as an occasional user of a RSS feeder. This person can navigate through the application with few complications. Also, the user has used RSS feeds three or more times, but does not consistently use RSS aggregates as sources for reading published online content (less than one time per week).

End-user – a person who engages with the computer application. For this study, this person subscribes to an RSS or Atom feed and receives the feed’s updates.²

¹ To define Atom feed the researcher consulted Flaherty (2010) and Hammersly (2005)

² To define end-user the researcher consulted Human Computer Interaction resources. For conceptual foundation and full discussions, see Shneiderman (2009) and Nielsen (1990).

Frequent end-user – a person who engages with the computer application, habitually uses and interacts with a RSS feeder multiple times per week and uses RSS or Atom feeds as a primary sources for reading published online content.³

Habitual use – the frequent use of an application. The user interacts with RSS feeds multiple times per day, at least three (3) times.

Information literacy – “Incorporates notions about what a literate person will be able to do. The literate person will be able to effectively access and evaluate information for a given need. This definition not only identifies the skills of accessing and evaluating but also specifies the application of skills” (Kuhlthau, 1987, p. 8).

Information overload – overload occurs when an end-user can become overwhelmed by the amount of content or information retrieved from a source. The end-user may experience difficulty in filtering and understanding the content. “Represent[ing] a state of affairs where an individual’s efficiency in using information in their work is hampered by the amount of relevant, and potentially useful, information available to them. The information must be of some potential value, or it could simply be ignored, and it must be accessible, or the overload will only be potential, not actual” (Bawden, 2009, p. 182).

Non end-user – a person who engages with the computer application, but has limited experience with RSS or Atom feeds. A non-user has limited knowledge and experience using aggregating applications. The students may be aware of how feed aggregators operate and be able to identify examples of aggregators, but has used them fewer than two times.

³ To define the terms associated with end-users’ levels experience (e.g. frequent, infrequent, and non) the researcher determined her own classification based on general principles of experience; Marchionini (1989), Lazonder (2000) and Shneiderman (2009) were reviewed in determining guidelines for classification.

Primary site navigation – this occurs when an end-user uses the main website for the content's source and browses for any retrieved content, rather than an RSS feed.

Push electronic content – the end-user subscribes to a publisher or content source and the preferred content collection system sends publisher's content without the end-user having to pull the pieces of content individually from a site; the content is push electronic content.⁴

Publication-Subscribe systems – These systems allow end-users to subscribe to published content that the system delivers to the end-users' preferred content collection system. It is "a distributed computing paradigm that consists of three principle components: subscribers, publishers, and an infrastructure for event delivery" (Liu, 2005, p. 30).

RSS – Really Simple Syndication or Rich Site Summary. This is an open XML standard that "enables the definition, transmission and interpretation of data between applications and across platforms" (Paulson, 2004, p. 24). This standard allows end-users to subscribe to published or syndicated content. The feed contains metadata related to the original source's content and is published to an end-users feed aggregation client.

Site navigation – A phrase to describe how the end-user interacts with a website; the paths the user takes while using the site. The user's navigation path develops from the moment the end-user loads the site until the end-user leaves the website. The researcher also defines the navigation path by the number of clicks and time the end-user spends on each page.

User engagement – This phrase describes how the end-user interacts with the multimedia resource and describes the end-user's experience with the technology. User engagement is a "category of user experience characterized by attributes of challenge, positive affect,

⁴ To define push electronic content, the researcher consulted Liu, et al. (2005), Paulson (2004) and Harold (2006).

endurability, aesthetic and sensory appeal, attention, feedback, variety/novelty, interactivity, and perceived user control” (O’Brien and Toms 2008, p. 941).

User Satisfaction – A phrase to describe how the end-user perceived his/her experience using the system or software or an “end-user’s overall affective and cognitive evaluation of the pleasurable level of consumption-related fulfillment experienced with the IS [Information System]” (Au, *et al.*, 2002, 453).

CHAPTER 2: LITERATURE REVIEW

To date, aspects of end-users' involvement with RSS and push electronic content systems are topics not frequently researched. Most of the published research on RSS feeds and publication-subscribe applications focuses upon architectural concerns and issues facing those who publish electronic content, but it does not focus upon those who subscribe and receive publish-subscribe content.

Given the many digital and online environments for information seeking and retrieval, studies concerned with various facets of online environments and information behaviors have proliferated. The hypertext environments have evolved into multi-faceted, non-linear systems far from the original Hyperties, HyperCard and NoteCards systems of the 1980s (Carmel 1992, Nielsen 1990, and Marchionini and Shneiderman 1988). Systems now integrate hypertext and hypermedia so end-users can navigate more easily through interfaces. Browsing behaviors have been of interest to information professionals for decades, but the transition from print to digital has increased the research in the browsing, searching and retrieval behaviors of end-users. This literature review attempts to explain the connections between the concepts of hypertext and browsing and to show how their applications have evolved into the modern feed aggregates and dynamic online web systems.

Hypertext and hyperlinks have contributed to the development of many complex, non-linear systems. Google Reader, which will be discussed in detail in Chapter 3: "Research Design and Methodology," was built from a collection of hyperlinks. Google Reader provides options for the end-user to navigate, browse and view the RSS and Atom content.⁵ Each RSS or Atom story has a hyperlink that references an article's original source (i.e., the title of a New York

⁵ Images of Google Reader and the various functions are available in Appendix E.

Times' article or the original. The end-user can open the original article in another window or tab by clicking the article's title). Understanding the basic principles of hypertext and hypermedia is essential to understanding how complex the browsing experience can be for the end-user.

2.1 Hypertext and Hyperlinks

Hypertext environments contain hyperlinks that allow end-users to navigate to a document located on another page or location on the same page. Graff (2005) suggests that "Hypertext environments are generally designed using a spatial metaphor, the underlying assumption being that navigating for information in a hypertext environment involves similar psychological functions to finding one's way in a physical environment" (p. 94). This navigation in a hypertext environment is called browsing.

According to Nielsen (1990), "hypertext presents several different options to the reader and the individual reader determines which of them to follow at the time of reading the text" (p. 1). Using hypertext provides the reader with more options for interacting and exploring published online content. The end-user can open hyperlinks as tabs in browsers or as new windows. Related to this research, Google Reader is composed of many hyperlinks that allow the end-user to view content, navigate away from the system to the article's primary web source, alter the views of how the content is displayed, etc. As hypertext systems have evolved, web developers have advanced online systems. Google Reader is the result of extensive development and hypertext integration and design.

2.2 Browsing

Browsing our environment is a pervasive behavior that some would argue is intrinsic behavior dictated by our biological makeup as a way of keeping ourselves alert and interested in our environment. In her 2007 study, “What is Browsing – Really? A model drawing from behavioral science research,” Marcia Bates addresses the problems that have been associated with defining browsing as a behavior. She argues that “much has been written about browsing in the library and information science literature, but it has generally been found difficult to specify browsing too closely, because 1) the conditions under which browsing is used vary widely, 2) it seems to be rather unpredictable in its very nature and 3) it seems to be employed in both more and less intentional ways” (p. 2). So, while browsing is a well-recognized behavior, characterizing its attributes and creating an accurate and standardized definition has been a difficult process with debatable outcomes.

Researchers have been studying browsing behavior for many decades. With the advent of computer environments and hypertext content, literature that addresses browsing has grown. Marchionini and Shneiderman (1988) define browsing as “an exploratory, information seeking strategy that depends upon serendipity,” and claim that “end users rationalize inefficient information-seeking strategies by hoping that incidental learning will have a beneficial cumulative effect” (p. 71). Borgman, *et al.* (1995) have a different take on browsing. They identify browsing as “an interactive process of skimming over information and selecting choices. Browsing relies on recognition knowledge and requires less well-defined search objectives than does directed key word searching” (p. 666). Bates (2007) raises issues with many of these definitions because they do not capture the essence of skimming. In evaluating the definition

formulated by Rice, *et al.*, Bates questions their logic. Her primary concern is to understand what Rice, *et al.* meant by “browsing” and why we browse. She concludes that:

Browsing can be seen to contain four elements, iterated indefinitely, until the overall [browsing] episode ends:

1. Glimpsing a field of vision;
2. Selecting or sampling a physical or representational object from the field;
3. Examining the object; and
4. Physically or conceptually acquiring the examined object, or abandoning it. (p.7)

The researcher of this thesis project will analyze the end-users’ interaction with Google Reader by applying Bates’ definition and characteristics of browsing.

2.3 Browsing in Hypertext Environments

Since the mid to late 1980s, scholars have researched how end-users interact with hypertext systems. Carmel, *et al.* (1992) studied browsing within a hypertext environment and they observe that, “browsing [as] an activity that hypertext users commonly engage in” and that “Hypertext supports and encourages browsing by providing links between keywords and topics that can be explored at will as the focus of exploration changes; hypertext makes users feel that they are in control, free to explore according to their own needs” (p. 865). Other researchers developed frameworks and models for evaluating end-user browsing behaviors. Marchionini and Shneiderman (1988) developed a framework that identifies success in seeking information. Carmel, *et al.* used Marchionini and Schniederman’s framework and applied it to identifying “variables that effect browsing” (p. 866). Carmel, *et al.* identify these factors as:

- 1) *Setting* – The physical environment, time allotted, access cost, plus the ‘functional constraints’ of motivation and purpose – all factors that enable the search task
- 2) *Search System* – The database structure and human-computer interface that structures the knowledge and defines how it is accessed
- 3) *Task domain* – The body of subject-area knowledge encoded by the system developer
- 4) *User* – The user’s mental model and experience with the task, system and search skills determine the user’s orientation toward the search task; these are types of

- expertise. A user with a good mental model of the task domain will browse differently than one who is trying to comprehend the structure of the knowledge.
- 5) *Outcomes* are the product and process obtained from the search. (p. 867)

Years later, Toms (2000) studied 47 adults as they performed two tasks within a system that contained current news articles. Toms, too, used an amalgamation of previous definitions to define browsing and develop a methodology for evaluating how end-users engage with browsing in an electronic text system. In Toms' study, browsing is an "an activity in which one gathers information while scanning an information space without an explicit purpose" (p. 423). Bates (2007) argues,

The design used by Toms better supports the natural physical sense of browsing that feels most native to human beings, than do many other experimental and operational systems. In effect, the menus provided the orientation that is normally implicit in the physical environment, but which must be provided explicitly in some way in an electronic environment where screen can instantly replace screen and thus disorient the searcher, as in a typical World Wide Web browser. (p. 13)

Bates further asserts that Toms evaluated a system which parallels the physical behaviors that browsing elicits in the physical world. Bates insists that a "more explicit and self-conscious test of this model [Toms'] would be needed for greater confidence that my model is a good one" and continues to suggest that "testing the model of browsing presented herein, both in physical and electronic environments, is a very promising direction to go in and may lead to a more accurate representation and understanding of the human behavior of browsing than we have had to date" (p. 13).

This study proposes to evaluate Google Reader as a system that promotes browsing. Google Reader supports different types of feeds (i.e., RSS or Atom feeds), and those feeds may contain content in addition to the existing hyperlinks. The content may feature videos, audio and still images. These elements may attract end-users and promote browsing, because "good browsable interfaces would consist of rich scenes, full of potential objects of interest, that the eye

can take in at once, then select items within the scene to give closer attention to” (Bates, 2007, p. 12). Combining Bates’ definitions and characteristics of browsing with the methods of Carmel, *et al.* and Toms provides a rich context for evaluating hypertext systems. The next step is to observe the current generation of browsable systems and further observe how end-users are using these systems to browse as we continue to consider Bates’ questions of “What is browsing?” and “Why do we browse?”

Browsing may involve a complex set of interactions for the end-user, leaving the end-user feeling lost or disoriented. Studies (Foss, 1989 and Carmel, 1992) have discussed the Embedded Digression Problem and the Art Museum Phenomenon. Essentially, these two issues may be consequences of browsing in non-linear systems. Foss (1989) argues that these problems “are inherent in the very nature of hypertext since documents often contain hundreds of linked nodes forming a complex structure, yet only a small portion of them can be visible on the screen at once,” which can lead to other problems “includ[ing] retrieval failures and trouble navigating towards or jumping to desired neighborhoods in the network, as well as uncertainty about the extent to which the relevant portions of the network have been examined” (pp. 408 – 409). Having a better understanding of why users experience these problems and how to design systems that reduce these feelings is important to successful user interface design. Additionally, analyzing what drives end-users to click and engage with specific hyperlinks over others may contribute to a better understanding of browsing behaviors in hypertext and online environments.

2.4 Experience Level Studies

As the study of human-computer interaction (HCI) has gained in popularity, researchers in the field of usability and HCI have studied the variances between behaviors exhibited by novice end-users and expert end-users (Marchionini, 1989 and Lazonder, *et al.* 2000). These

studies focus on how novices use the systems and how their success compares to that of the expert-users who use the same systems. Systems designers take end-user studies seriously and thus include accommodations for both groups (e.g., direct manipulation, shortcuts, easy to operate settings, drop-down menus, etc.). Because Google Reader is a web application that has features for both groups, it is important to evaluate whether use of the system impacts how the end-user responds and interacts with the RSS client.

Marchionini is a researcher who is fascinated with browsing and the information-seeking strategies of end-users. In his 1989 study, he examined whether novices could successfully use a full-text electronic encyclopedia with minimal instruction. Marchionini concluded that the young novices could use the examined system successfully, but the sophistication of their queries differed based on their age and domain knowledge. He recommended that “system designers should carefully consider what features are made explicit to users and which are hidden and how defaults are set if they expect novices to take full advantage of a system” (p. 64). Similarly, Lazonder, *et al.* (2000) discovered that domain expertise and experience can influence query generation, but end-user web experience does not drastically affect the performance of the studies assigned task; they assert that “finding information on a Web site generally implies browsing, and hypertext research has shown little to no differences between novice and expert browsers” (p. 580). Evaluating novice and expert end-users will provide the researcher with data to compare to these previous findings. This researcher intends to use novice and expert experience as measurements for usability tasking. No other usability study on browsing has focused specifically on Google Reader.

2.5 Usability

Research in usability studies has grown significantly as human computer interaction has progressed as a field. Nielsen (1993) discusses usability as it “applies to all aspects of a system with which a human might interact, including installation and maintenance procedures” (p.25). Specifically, Nielsen defines it by “multiple components [that are] traditionally associated with these five attributes.” The five attributes are learnability, efficiency, memorability, errors, and satisfaction (p. 26). He uses those terms to build a definition of usability based on “more precise and measurable components” (p. 26). Pearrow (2007) defines usability as “the broad discipline of applying sound scientific observation, measurement, and design principles to the creation and maintenance of websites to bring about the greatest ease of use, ease of learnability, amount of usefulness, and least amount of discomfort for the humans who have to use the system” (p. 15). In summary, researchers study how individuals interact with the computer and whether the system used is useful in achieving the goal of the system.

As the study of usability has increased, many researchers have worked to develop ways of measuring the usability of systems. Shneiderman (2009) developed measurements of usability in interface design with his “Eight Golden Rules of Interface Design.” He suggests that his rules “are applicable in most interactive designs [and] these principles, derived from experience and refined over three decades, require validation and tuning for specific design domains” (p. 70). He acknowledges that “these underlying principles must be interpreted, refined, and extended for each environment. They have their limitations, but they provide a good starting point for mobile, desktop, and web designers” (p. 71). Understanding how end-users interact with systems, the functions are used, the efficiency and success of these systems, and if the systems are useful in

achieving the goal are important in usability studies. This understanding provides researchers and systems developers with measurements and indicators for system or site improvement.

2.6 RSS

The research on hypertext systems and browsing is more plentiful than that directly addressing RSS feeds. A majority of the research in RSS focuses upon the system architecture and design and its publication uses. Little has been researched on end-users' responses and uses of RSS, especially related to the topic of browsing. There are a few studies that address affective reactions, but their scopes are limited to a particular domain of knowledge. In the article by Liu, *et al.* (2005), the researchers study how clients actively and passively interact with the system. The authors note that "previous research in this area has focused on aspects, such as system architecture, event notification, and content filtering algorithms, but has left a fundamental issue untackled [sic.], namely what does the workload of a pub-sub system look like and how do clients use pub-sub systems in practice" (p. 29). The researchers developed tracer software that followed the RSS traffic to evaluate the RSS feeds' characteristics. They found that "over a third of the clients fetch feeds manually and do not use automated RSS tools that poll and check for updates periodically" and "over a half of clients poll feeds hourly, which is the default setting of most RSS readers" (p. 29). While this article and others similar to it address issues related to the technical aspects of RSS feeds, Thelwall and Prabowo (2007) start the discussion of end-user behaviors and affective responses; they also engage in a project with minimal theoretical understanding of how users are engaging with these systems. Their study discusses these behaviors in relation to "identifying significant public science-related concerns from a corpus of Internet-based RSS (Really Simple Syndication) feeds" (p. 379). Also, they did not address browsing as an end-user behavior. In order to continue the discussion of browsing behaviors,

this study proposes to address concerns related to browsing fundamentals and to address the questions in the following sections.

2.7 Review of Previous Research Design and Methodologies

Due to the sheer volume of research on information seeking behaviors and interactions, selecting and developing a methodology is a difficult task. The body of literature suggests several methodologies, such as with the Goals, Operators, Methods and Selection Rules (GOMS model) that end-users incorporated into their browsing habits as seen in Carmel, *et al.* (1992). Several studies have incorporate cognitive measurements built upon the Field-Independent Field-Dependent models of Harold Witkin (Witkin 1977, Fiorina 2007, Kim 2002, Wang 2000). Studies have used cognitive measurements of different instruments to measure thinking styles. Calceterra (2005) used two tests to measure cognitive thinking styles (e.g., the spatial orientation situational inventory or the style of learning and thinking test) and Wang (2000) used the State Trait Anxiety Inventory in her study of cognitive styles. With so many instruments and methods for analyzing the data, it is important for the researcher of this study to explain the choice of the methodology as well as how the researcher will collect and code the data.

Bilal's research in "Children's Use of The Yahoooligans! Web Search Engine" approaches data collection and analysis in several ways. Although Bilal (2000, 2001, and 2002) had a small sample size (22 participants), she used both quantitative and qualitative analysis to measure the cognitive, physical and affective behaviors of the participants while completing in web searching tasks.

Bilal's third article in the series, "Children's Use of the Yahoooligans! Web Search Engine" (2002) discusses the "Taxonomy of Tasks" and includes a figure to demonstrate how "closed- and open-ended tasks can be administered in three ways: fully assigned, semi assigned,

or fully self-generated” (p. 1171). She gave students the opportunity to create their own tasks and compared the results of the assigned tasks of the two prior experiments (Bilal, 2000 and 2001). The figure is featured in Appendix A. In this study of Google Reader, the researcher plans to administer one open-ended and one closed-ended task and then use the results for comparison. The researcher will develop methods unique to this study as well as incorporate modified elements that were featured in Bilal’s studies.

In a 2000 study, Elaine Toms evaluated the browsing habits of 47 participants. She placed a newspaper’s online content into a system that had different tools to mine and analyze content.⁶ Toms used a combination of open-ended and closed-ended tasks to test the participants. She used several instruments to collect the data, including a usability assessment, a post-session questionnaire, audit trails (e.g., data logs), retrospective verbal protocols, and post-experiment assessments. Data from the audit trails were similar to the data that will be collected by the MORAE Manager for this study. Also, this thesis will incorporate a modified version of Tom’s retro protocols in this thesis’s exit interview. Toms had the participant review the session with the researcher and have “the participants elaborate on the articles examined, providing several types of data such as articles previously known to the user and the interest level of articles examined” (p.11). A similar transaction will take place in the Google Reader study. Toms also conducted usability assessments and administered post-session questionnaires to the participants. For this thesis, the researcher configured post-task surveys administered to each participant. Overall, Toms presents a few valuable methods and tools for collecting and evaluating data that will be modified for the Google Reader study and optimized to the features of Google Reader and the system affordances of MORAE.

⁶ Appendix B has a screenshot of the system Toms investigated.

The Google Reader study will be an exploratory research study to evaluate the browsing behaviors of the participants. There are similar studies that have taken exploratory approaches. Wang, Hawk and Tenopir (2000) present an exploratory study to introduce a cognitive model for studies investigating World Wide Web resources. Their study observes 24 participants in assigned tasks and analyzes their cognitive and affective behaviors. The researchers used instruments such as the Embedded Figure Test, which evaluates field-dependence versus field-independence and the State Trait Anxiety Inventory, which looks at different types and levels of anxiety in the participant. The Process-tracing technique collects verbal reports from the participant, monitors and records activities (e.g., keystrokes and screen actions). Similar to Toms' study, this thesis used a computer to record the participants' actions. This method will be adapted to the Google Reader study and optimized with MORAE, which can record the screen, the tasks completed and the visual and audible reactions without being overly obtrusive during the participants' recorded session.

Given the vast amount of research that has been conducted with similar topics, identifying the most appropriate and adaptable methods has been essential to developing the methodology for this thesis study. The researcher of this thesis study has used the literature to understand how previous research has tested end-user engagement and information behavior. The review of the previous research has helped the researcher develop her methodology and instruments for testing how end-users engage with Google Reader.

CHAPTER 3: RESEARCH DESIGN

3.1 Research Questions

The researcher observed the end-users' behaviors with the intentions of exploring how the end-users interact with the system. The researcher sought answers to the following questions:

1. How do end-users interact with Google Reader? What functions do they use?
 - 1.1 What browsing characteristics do the end-users exhibit while using Google Reader?
2. How do end-users experience levels affect their browsing behaviors when using Google Reader?

3.2 IRB Approval

The researcher submitted the application for the Review of Research Involving Human Subjects to the University of Tennessee Institutional Review Board. To ensure that the participants were visually engaged in the research study's tasks, the researcher recorded both audio and visual data. To meet the additional safety and security protocol that accompanies recorded audio and visual data, the researcher submitted the IRB Form B prior to data collection. The researcher received approval for the IRB application on December 7, 2010. A copy of the Informed Content statement can be found in Appendix F.

3.3 Setting

Once the researcher received IRB approval, she recruited her participants and testing began. The researcher used the University of Tennessee (UT) - Oak Ridge National Laboratory (ORNL) User-Experience Lab, located in room 230 of the Communications Extension Building.

The lab has two testing rooms; each room has a computer with the MORAE software package installed, a camera on the monitor to record the participants' faces, and a built-in microphone to record any sounds the participants make. The lab has one observation room with computers available to capture, record, observe and export the data collection from the computers the participants used.

For this research, the researcher collected, observed and analyzed data using the MORAE software package. MORAE can record and replay the initial end-user experience questionnaire, surveys and tasks, which provided the researcher with the opportunity to assess the end-user's session and task engagement prior to conducting exit interview. By using MORAE, the researcher was able to successfully record all of the participants complete the tasks and create extensive task analysis that capture how participants interacted with Google Reader.

3.4 Participants

The researcher worked with a professor from the University of Tennessee's Communication Studies department to solicit volunteer participants. The Communication Studies school, "combines expertise in interpersonal and organizational communication to study the communicative aspects of human relationships including: mentoring, leadership, socialization, organizational development, social networks, conflict, organizational change, and persuasion. Put simply, we focus our efforts to answer questions about how humans exchange information within interpersonal and organizational contexts."⁷ After meeting with three of the professor's classes, 25 undergraduate students participated in the full study. In exchange for their volunteered time, their professor offered the students extra credit points on their class grade.

⁷ *Communication Studies Home*. Retrieved on March 22, 2011 from <http://www.cci.utk.edu/commstudies>

To be fair, the professor did offer other extra credit opportunities for the participants who did not want to volunteer for participation in this study.

Participants from these Communication Studies classes were recruited, because these undergraduate students could be potential end-users for using Google Reader. They would be considered potential end-users because they work or will work in fields that deal with technologies and the rapid release and communication of information. Also, in their courses, they study information and communication patterns, specifically, how individuals communicate with one another, both verbally and textually.

Not only were these participants identified as potential end-users, a majority of the participants were born in or after 1990, which means they had been exposed to the Internet and have had access to the Internet for a majority of their lives. In addition to their exposure to the Internet, a majority of these students are familiar with social networking tools, media and mobile devices, as they would have been young teenagers when the technologies were being released (e.g., Myspace, 2003; Facebook, 2004).⁸ As they have grown into adulthood, social technologies, the expansion of cell phone and smart phone and portable technology markets have become ubiquitous in their lives (e.g., iPod, 2001; iPhone, 2007; iPad, 2010).⁹ Due to the ubiquity of these technologies, the researcher assumed that she could find undergraduate participants who had used RSS technologies, such as Google Reader or similar systems, in their personal or professional lives.

For this study, each of the 25 participants completed the same tasks, questionnaires, surveys and exit interviews; however, 18 participants were later selected based on their ages for

⁸ Nickson, C. (2009, January 21). "The History of Social Networking." *Digital Trends*. Retrieved on March 19, 2011 from <http://www.digitaltrends.com/features/the-history-of-social-networking/>.

⁹ "MacTimeLine." Retrieved on March 19, 2011 from <http://mactimeline.com>

this study's full analysis. The sample of 18 students ($N = 18$) was selected based upon the participants' ages; only the participants who were between the ages of 20 and 21 at the time of the data collection were included in the sample. The reason for using participants who were between the ages of 20 and 21 at the time of data collection was to have a defined or controlled sample for looking at the data. These users are identified as the Net Generation, being born on the late in Generation Y and a little before Generation Z; they have grown up in the age of downloads and increasing access to multimedia through technologies, where they share information with one another via social networks and Internet workspaces (e.g., online classes, online document sharing software, etc.).¹⁰ Controlling for age also provided the researcher the opportunity to control for the participants' genders, because all of the participants aged between 20 and 21 years old were female. The results from the sample's analysis are discussed in Chapters 4 and 5.

3.5 Methodology

3.5.1 Instruments

For this study, the researcher developed three instruments to gauge end-user experience. The instruments used in this study were a user experience level questionnaire, a Google Reader online activity, and an exit interview.

The questionnaire combined opened-ended and closed-ended questions to assess the participants' experience levels with Internet resources. The online activity involved two primary

¹⁰ Posnick-Goodwin, S. (2010, February). "Meeting Generation Z." *California Teachers Association*. Retrieved on March 17, 2011 from <http://www.cta.org/Professional-Development/Publications/Educator-Feb-10/Meet-Generation-Z.aspx>

tasks: (1) an implicit, open-ended task without a stated goal and (2) an explicit, closed task that has a stated goal and deliverable.

To deliver the user experience questionnaire, the Google Reader online activity and subsequent survey questions to the participant, the researcher configured MORAE's autopilot functions so that one task or activity ran seamlessly into the next portion of the participant's testing. The researcher created Google Reader accounts for the participants, none of the participant's data was associated with the creation of the Google Reader accounts. Once they started the first task, participant would be asked to log into the site using the email and password provided for them on a handout.¹¹ After the participant completed the computer portion of the testing session, the researcher conducted an exit interview to discuss the participant's experiences using Google Reader.

Before the researcher started the full study or testing the participants, she conducted a pilot study with two volunteer participants. The pilot test provided the researcher with the opportunity to fine-tune and edit the tasks to ensure that the study's testing would be efficient and work to answer this study's questions.

3.5.1.1 Instrument Design

The researcher used a combination of qualitative and quantitative methods to explore how end-users engage with Google Reader and develop a dynamic depiction of user engagement.

The first instrument used in the study was the user experience questionnaire. The questionnaire asked questions related to the participant's familiarity with websites, RSS feeds and Google Reader.

¹¹ An example of the handout can be reviewed in Appendix H.

After completing the questionnaire, the participant would use account information provided to him or her before testing started to log into Google Reader. Once in Google Reader, the participant completed the first task before interacting with the second instrument, a brief survey. This survey asked about the participant's experience during the first task. The second task began after the first survey had been completed. The participant was asked to complete the second survey before the testing session ended. The second survey, much like the first survey, asked questions pertaining to the participant's second task.

The final instrument was the exit interview. The researcher would meet with the participant after the test concluded and the participant completed all of the surveys. During the exit interview, the researcher would ask questions based on the user's experience level, affective reactions during the experiment, ask for further clarification of survey answers and discuss issues or problems the participant encountered while completing the tasks. The researcher used these exit interviews to gauge the end-users' affective reactions to their experiences with Google Reader.

3.5.1.2 Procedures

Data collection began in January 2011. The researcher met with three (3) different Communication Studies classes taught by the same professor and provided a brief introduction of the study. During these class sessions, the professor explained the potential for extra credit opportunity and the professor offered other extra credit opportunities, so as not to coerce students into only participating in this study.

Volunteers signed up on sheets that were passed around the class; every volunteer was contacted. Initially 61 students signed up, but after the first round of contact emails, the researcher only received responses from 32 students. To ensure that she would have enough

data, the researcher scheduled all 32 participants for testing. Of the 32 participants, only 25 participated in the full study. These 25 students completed all of the study's tasks, surveys and interviews.

All of this project's testing occurred in the ORNL-UTK Usability lab over a 3-week period from the end of January into the month of February. After the no shows and rescheduled participants were accounted for, 25 participants fully completed the study.

Once the participants arrived in the lab, they were instructed to review the Informed Consent form. After any questions regarding the participant signed the Informed Consent statement, the researcher gave the participant instructions on how to use Morae and gave the participant a handout with the Google Reader account name and password. Using the Google Reader account setup by the researcher, the participants logged into the system and completed the assigned tasks.

When the researcher left the participant's room, the participant began the first questionnaire. The researcher observed the participant's task completion from the observation room. The researcher made notes and marked the participant's recording for any issues that she wanted to ask the participant during the exit interview. After the participant completed all of the tasks and surveys, the researcher returned to the participant's room and conducted the exit interview.

Once data collection of all 25 participants was completed, the researcher compiled the survey and questionnaire results; transcribed all of the tasks and transcribed the exit interviews. To control the sample, the researcher selected a sub-set of participants who were between the ages of 20 and 21 at the time of testing. All of the 20 and 21-year-old participants were also female. All of the 18 participants ($N = 18$) were either 20 or 21 years old at the time of testing

and all were female Communication Studies majors. The researcher took the sub-set's data and coded the transcripts based on core themes, categories and conditions as discussed in Chapter 4.

3.5.1.3 Tasks

To examine end-user engagement with Google Reader, the researcher developed two tasks that required the participant to use the Google Reader site and its functions.

The first task was an open-ended browsing task. The participants were instructed that they had 10 minutes of free time, which they were to use to acquaint themselves with the system. During this time they were allowed to configure the settings, feeds, and to experiment with or test any of the functions or navigation menus they encountered. At the end of the 10-minute period, the researcher sent a survey to the machine the participant used that asked him/her to evaluate the previous task. When the participant completed the survey, the next task would begin.

The purpose of the second task was to use various system functions to examine whether the usability of the system would affect how the participant interacted with the articles and their information. The first sub-task was to add five add feeds, or subscriptions, to the participant's list of subscribed materials. Following the feed task was the second sub-task asking the participants to read at least five stories or articles and then mark those read with a "Star". The third sub-task asked the participants to identify articles that they might share via social networks and "Share" or email articles with the researcher. After the participant finished the third sub-task, he/she received a final survey.

3.5.1.4 Google Reader

Google Reader is a web-based feed aggregator that reads both Atom and RSS feeds, which create a dynamic and versatile experience for browsing and site navigation. The

aggregators allow end-users to subscribe to desired feeds and organize, filter and search their feeds. Google Reader also allows the end-user to choose his preferred orders (e.g., by date or by relevance). The system offers help features to infrequent and non-users and shortcuts and advanced operation tools for frequent users, thereby catering to both user groups.¹² Because the RSS client offers two different feed standards, the contents' format may vary. Some feeds may only consist of the RSS conventional hyperlinked title and a short blurb summarizing the article, while other feeds may contain full-text articles with embedded videos, images or song clips. Since there are many types and article formats, this study should offer insights as to what elements attract end-users while they are browsing and using feed based clients.

3.5.1.5 Pilot Test

To prepare for the full study, the researcher had two volunteer participants complete pilot testing. After the pilot study, the researcher refined the test to remove spelling errors, write clearer task instructions and to make the necessary adjustments to the exit interview. Having the opportunity to make the adjustments and refine the study helped the researcher minimize errors and maximize data collected.

3.5.2 Data Analysis

The researcher incorporated a mixed methodology to analyze all of the results. The researcher analyzed the data that was output from the questionnaire, surveys and parts of the task analysis using quantitative methods. For the exit interview, the researcher used Strauss' coding paradigm and incorporating axial coding.¹³ The researcher analyzed the exit interview to

¹² Images of Google Reader and the various functions are available in Appendix E.

¹³ Strauss, A. (1987) *Qualitative Analysis for Social Scientists*. Cambridge, NY: Cambridge University Press.

identify core themes and problems, which created structure for the data and helped build relationship between the codes.

The researcher gathered the quantitative data with the questionnaire, the two task surveys, and the task analysis logs. The questionnaire consisted primarily of closed questions regarding previous user experience; there were only a few opportunities to answer open-ended questions (i.e., the participant could describe how often and in what capacity they had used Google Reader). For the two task surveys, the questions were asked using closed-responses; the participants answered using Likert scales and Yes/No responses. The questionnaire and surveys were computed prior to the coding of the exit interviews and the evaluation of the task analysis.

The researcher watched all of the participants complete the assigned tasks. The researcher recorded every click and selection each participant made. The researcher used the participants' clicks and selections as data points and the researcher coded all of the participants' movements to detect any patterns or trends. The researcher used each task analysis log to mark all of the data points, such as time to complete task, success or failure rates, selection made, path taken, and recursive actions. The researcher compiled the data from all of the participants and extensively analyzed the task analysis logs to identify usability themes and to analyze how the participants used Google Reader to browse, search for, and read articles. Given the complexity of the task analysis and the amount of data generated, controlling the sample ($N = 18$) provided the researcher with the opportunity to analyze a homogenous group of participants. Once the researcher completed the task analysis, she coded the responses from the exit interview.

The exit interview analysis involved transcribing the interviews and then identifying core themes and issues and then building relationships to create structure in the data. The researcher reviewed all of the responses from the exit interview to identify themes, core issues and patterns

from the participants' responses. The qualitative data from the exit interview was used to analyze participants' affective states and how the participants' viewed their Google Reader sessions. After the researcher completed the coding of the qualitative data was complete, she reviewed both sets of data (e.g., quantitative and qualitative) to identify any broader themes or issues that resonated in the data sets.

3.5.3 Data Management

The researcher complied with all of the guidelines and requirements of the University of Tennessee's Institutional Review Board (IRB). She submitted the IRB Form D and received approval by the Review Board before data collection began. The researcher is committed to the principles and rules as mentioned by the Institutional Review Board and affirms that no subjects were harmed and that all of the subjects' data will remain concealed and anonymous.

The researcher has kept and will keep all data confidential. Each participant signed an informed consent statement, which the researcher has kept these forms in a secure location. The data has been stored in password protected or locked files that only the researcher can access.

3.6 Limitations

The researcher acknowledges potential limitations of this exploratory study. The researcher controlled the sample for age, gender, and undergraduate major. As explained below, the limitations include the controlled sample, feed aggregator selection, Internet, computer use, interviewing and timeline.

The population sub-set included eighteen participants ($N = 18$). The researcher used this study as exploratory research and addressed broad questions about information behaviors. In the literature, exploratory studies have used smaller sample sizes to gather baseline data on

information behaviors; Bilal (2000, 2001, 2002) used an initial sample of 22 ($N = 22$), but some data collection was reduced to 14 participants after technical errors; Wang (2000) used a sample size 24 ($N = 24$), and O'Brien and Toms (2008) used a sample of 17 ($N = 17$). Should this study progress into future research, the researcher will use a statistically significant samples based upon the population.

The participants who were included in the sub-set were all between the ages of 20 and 21 at the time of testing. None of the male participants who completed the testing were between the ages of 20 and 21, so gender was also controlled, because the sub-set ($N = 18$) consisted of 18 females. In total, the sample studied ($N = 18$) consisted of eighteen 20 and 21 year old, female Communication Studies undergraduate students. While the data may not be generalizable to a larger population of users and different user groups, within this specific population of users the results could be discussed as significant.

The researcher's use of only one feed aggregator is a limitation. Google Reader represents one RSS option out of many available systems. However, for a project of this scope, Google Reader proved to be a versatile, functional system that can be manipulated by the researcher.

Qualitative interviews also have their limitations. Participants may have altered their answers to fit upon perceived expectations. As a precaution, the researcher analyzed the data output from the first two instruments (the questionnaire and the Internet activity) and then used the exit interviews and task analysis to examine the results. This mixed methodology provides the researcher with nuanced results that will improve understanding of browsing behaviors.

The greatest limitation to this study has been time. This researcher optimized the intended sample size and procedures based upon the research timeline. If the researcher had

additional time, there may have been the potential for a larger sample size and more generalized data.

CHAPTER 4: RESEARCH RESULTS AND ANALYSIS

Introduction to Findings

The results and findings discussed in this chapter were collected from 18 participants (N = 18) over the course of three weeks of testing. The researcher will discuss how the participants, as end-users of Google Reader, interacted with the system and the information as presented in the system.

4.1 Participants Profiles and Demographic Data

4.1.1 General Testing: All Test Subjects

During the three-week testing period, 25 participants completed the tasks and interviews administered by the researcher. The researcher worked to recruit more equal gender representation, but several male participants were unable to keep their appointments. Of these 25 participants who completed the full testing, there were 20 female participants and 5 male participants. All of the students were undergraduates; one participant was a first year student, two participants were second year students, twelve participants were third year students, seven participants were fourth year students and three participants were fifth year students. There were two part-time students and the remaining 23 were full-time students. Twenty-four (24) of the students identified themselves as being Communication Studies majors. The ages of the students varied greatly, ranging from 20 – 46 years of age with an average age of 22.7 years old.

After all of the 25 participants had completed the testing, the researcher analyzed all of the data. To further control the sample set, the researcher identified those participants who were between the ages of 20 and 21 years old for full task and exit interview analysis. The researcher selected the 20 and 21 year olds to control for age and, which also controlled for gender as none of the male participants were between the ages of 20 and 21. The 20 and 21 year olds were the

youngest group of participants tested and they are all members of the Net Generation. This generation of end-users was born in the late stages of Generation Y and almost in Generation Z, which is characterized by the marked use of Internet technologies, especially mobile devices.¹⁴ This subset was chosen as a way to control for their exposure to technologies from a young age and throughout their lives.

4.1.2 Sample Population

Of the 25 participants who were tested and interviewed, the data collected from the youngest 18 participants was used. The average age of the group was 20.7; there were six 20 year olds and twelve 21 year olds. All of this sub-set of participants was female; none of the male participants met the age criteria, as they were all older (ages ranging from 22 – 46, with an average age of 30.4). All of the participants were enrolled as full-time undergraduate students, and they were all Communication Studies majors, although some had double and triple majors in addition to their Communication Studies major. Two participants were in their second year of studies, eleven participants were third year students and five participants were fourth year undergraduate students.

4.1.2.1 Internet Use of the Sample Population

Building a data structure based on Internet usage habits and patterns, the participants were asked to identify how much time in minutes or hours they spent on the Internet. After they indicated how many minutes or hours a day they used the Internet, the researcher asked them to differentiate between personal time and school or work time spent on the Internet. Participants

¹⁴ Cheese, P. (13 March 2008). "Netting the Net Generation." *Business Week*. [16 March 2008] http://www.businessweek.com/managing/content/mar2008/ca20080313_241443.htm?campaign_id=rss_null

indicated that on average, they spend three hours a day on the Internet, with answers ranges varying from one to seven hours per day. Of those three hours, 1.4 hours or roughly one (1) hour and 27.7 minutes are spent on personal activities; these personal activities range from email, social networking (e.g., Facebook and Twitter), watching shows, videos and movies online (e.g., via Hulu, Netflix or YouTube), to reading (e.g., news, blogs, op-eds), to shopping. The other one and one-half hours are spent on school and homework assignments; BlackBoard and TMail were the most commonly mention websites associated with these activities. Identifying how much time participants spend on the Internet and what activities or sites they are going to indicates that users are spending time doing a variety of activities while they were not in class, either related to school work or personal interests.

4.1.2.2 Google Use of the Sample Population

The researcher discussed searching for information and search engines with the participants. Each of the 18 participants stated that they had used Google as a search engine before; of those 18 participants, 17 participants (94.4%) indicated that Google was their default search engine, the other being Yahoo. One participant added, anecdotally, that, “[someone] will ask me something and I won’t know the answer, but I’ll say, ‘Let’s Google it!’” and “when I doubt [that] I don’t know or we don’t know the answer, we’ll Google it.”

When asked if they used other Google services such as Gmail, iGoogle or Google News, the usage results varied. While 100% of the participants used Google, only 12 participants (66.7%) have a Gmail account. Of the 18 participants, six participants (33.3%) said that they used Gmail on a regular daily or every other day basis. Six participants (33.3%) said that they had a Gmail account, but it was rare for them to use it for email. For iGoogle and Google News,

the percentages of usage were even lower, as only 3 participants (16.7%) reported to using iGoogle or Google News.

Knowing which Google services participants have used in the past allows for better analysis of the usability and satisfaction with Google Reader. Of the 18 participants studied, only one participant (5.6%) had used Google Reader. That participant also indicated that she had only used Google Reader for a class that she had taken several semesters in the past and had not used the system since. When comparing the rates for using Google Reader and for using RSS (in general), similar figures emerge. The one participant (5.6%) who had used Google Reader in the past was the only participant who had used RSS knowingly before the user testing. Having few infrequent end-users and no frequent end-users will be discussed in the next section.

4.1.2.3 RSS Feeds Use of the Sample Population

The user experience questionnaire was used to determine the participants' RSS feed and Google Reader experience levels. When asked, "Before today, did you know what an RSS feed is?" 16 participants (88.9%) answered that they did not know what an RSS feed was. When asked, "Have you ever used a RSS feed before?" 17 participants (94.4%) answered that they had never used RSS before. When asked, "Have you ever used Google Reader before?" 17 participants (94.44%) answered that they had never used Google Reader. The one participant who has used RSS and Google Reader, as stated in the previous section, has only used Google Reader and RSS for one of her classes several semesters earlier. She stated that she had not used Google Reader or RSS since the class. Seventeen (17) participants (94.4%) asked for the researcher to explain RSS technologies because they had little understanding of what they are and how they can be used. Overall, participants were inexperienced with the software and knew little of what RSS technologies do.

4.1.2.4 Facebook Use of the Sample Population

Communicating information and sharing multimedia via social networks have become much more popular over the past decade. To examine how this exchange of information could be affected by RSS technologies and to see what kinds of materials were being shared, one of the assigned tasks involved selecting potential items that the participants might share on social networks. To understand whether the participants had shared media before on social networks, the researcher asked a few questions related to social networks. When asked what social networks the participants belonged to, the resounding answer was Facebook. All 18 participants had a Facebook account and 17 of those participants (94.4%) use Facebook on a daily basis. To view average daily time participants spend on Facebook, refer to Figure 1.

When discovering feeds in the system, two participants (11.1%) unsuccessfully attempted to add their Facebook feeds to the system, while three other participants (16.7%) added blogs and bundle packages related to Facebook. In the exit interviews, participants also expressed their desire to have their Facebook feed fed through the system. This suggests that some of the participants wanted to further consolidate the websites that they frequent into one system.

When asked about the types of items they post on Facebook, 10 participants (55.6%) said that they do not post articles on Facebook, but they do post videos and other multimedia links. When asked why they would post a video to Facebook, the participants cited reasons related to convenience, accessibility, time management and interest. One participant stated, “I’d post Music videos, like YouTube and stuff, yeah. I would say that that’s about it though. Just because, whether we want to admit or not, a lot of people don’t want to take the time to read it, like articles versus a YouTube video. It just plays, you know. I think it’s all about convenience.” Others, too, insinuated that they do not want to share articles because they believe that others do

not want to take the time to read long articles. The participants who discussed instances when they had shared articles on Facebook suggested that they post articles on their friend's Facebook walls if they believed their friend(s) would “appreciate” the article or find the article useful or entertaining.

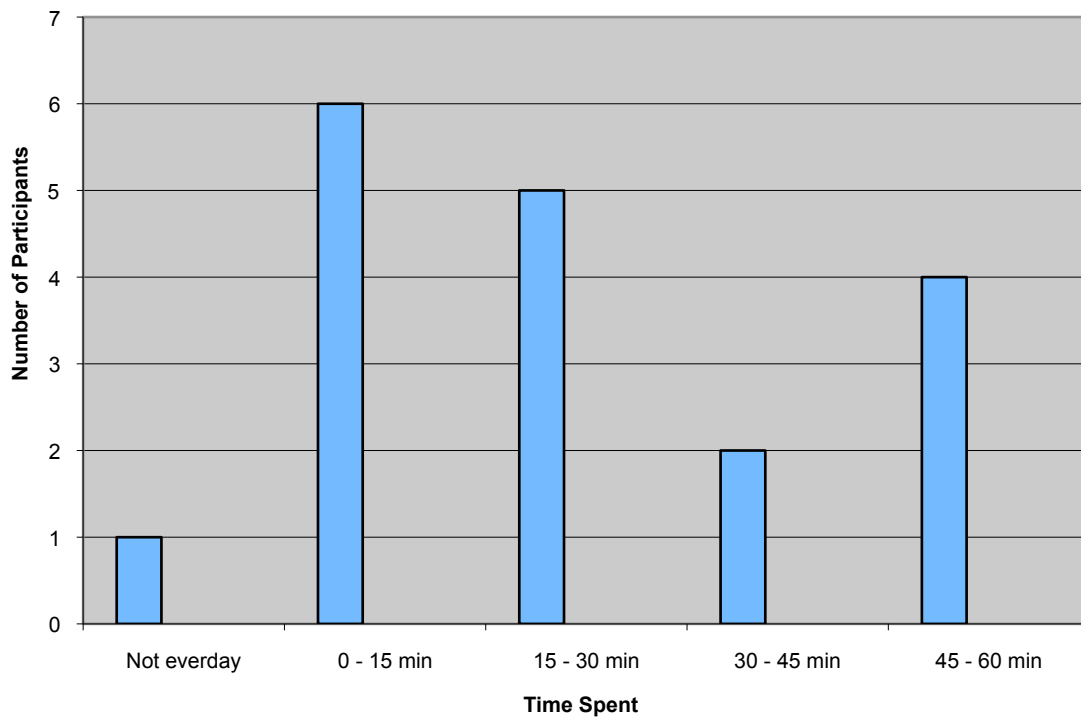


Figure 1. Daily Facebook Use (in minutes)

4.2 Results

4.2.1 How do end-users interact with Google Reader? What functions do they use?

In addition to the features that were required to complete the tasks, participants often encountered other features that affected their Google Reader site navigation and browsing experience. While some of the features proved useful to some participants, not every feature was viewed as favorably. Due to issues with participants' perceived uncertainty and lack of understanding, many were often left unsatisfied with the system. To answer the researcher's questions, "How do end-users interact with Google Reader?" and "What functions do they use?", we will discuss the functions that they encountered first and how the participants responded and interacted with the features.

4.2.1.1 *Introductory Materials*

Whenever end-users log into Google Reader for the first time, they are presented with a brief introduction, or as they say, "Welcome," to the site. Over the course of the 18 participant tasks observed, the researcher noted that Google Reader had two potential sets of introductory materials that it would present to the user upon their first site login. A description of the participants' first and most common introductory option is featured in Table 1. The participants' second option was a combination of "Getting started article" and the "Keeping track of what you read" article, plus a list of "Recommended items."

The selection of the participants' introductory items package appeared random. The introductory items were the first articles they saw under "Welcome to Google Reader" post. Of the 18 participants, 13 participants (72.2%) saw the first option with the five articles, while five participants (27.8%) saw the second, less detailed introductory materials package.

Table 1. Google Reader Introduction Items

Article Title	Article Description
“Getting started with Google Reader”	Provided a brief introduction to the site and what the system does
“Keeping track of what you read”	Provided a brief description of how the system tracks articles and marks those articles as read
“A quick video tutorial”	Provided a brief tutorial showing how to add feeds and how to use the site’s primary features
“What do all these buttons do?”	Provided a photographic description of an article’s bottom toolbar and title hyperlink
“That’s it, time to start reading!”	Provided a search bar that included the opportunity to navigate to the preconfigured feed bundles and view the “Staff picks” first

Of the participants who had the five full articles, only three of those participants watched the video tutorial (16.7% of participants). Seven of the participants (38.9%) used the fifth article, “That’s it, time to start reading,” to find feeds and bundles of feeds to the system. The results were mixed as to whether the introductory materials were helpful; overall, eight participants (44.4%) found that the feeds were not helpful; five participants (27.8%) thought it was partially helpful but wanted more material; and five participants (27.8%) found that the introductory information was helpful in navigating the system.

Looking further into how the participants perceived the introductory items, a correlation emerges between those who did not have full access to the materials and those who did have access to the full materials. The five participants (27.8%) who did not have access to the full materials overwhelmingly perceived the introductory item as not being helpful; four participants (22.2%) thought that it was not helpful, while only one participant (5.6%) thought the instructions were helpful. The results for the 13 participants (72.2%) who had the full materials were more mixed. Four participants (22.2%) thought that the materials were not helpful; five

participants (27.8%) thought that it was helpful but wanted more information; and four participants (22.2%) indicated that they thought the introductory materials were helpful. To see these results, refer to Appendix D.

Overall, while participants all may have read the introductory materials had been provided, because of the inconsistency in the two formats and the brevity of information provided, many of the participants thought that the introductions were not helpful enough or not helpful at all.

4.2.1.2 Recommended items

Google Reader provides a list of “Recommended items” for new and returning end-user to interact with whenever they are looking for additional sites to use for browsing or reading. When end-users add more feeds or subscriptions to the site, the system further refines those items it recommends and will later make recommendation for sources that the end-user may want to add to their list of feeds.

Similar to other features, the participants’ perceptions of the recommendations varied. Only 13 participants (72.2%) used the recommended items; of those participants only six participants (46.2%) approved of the recommended items approved and four participants (30.8%) disapproved of the recommended items. The remaining three participants (16.7%) were indecisive as to whether they approved of the recommendations, as they would “hit and miss” their interests.

Even though six participants (46.2%) who used the recommended items approved of the recommendations, seven participants (53.8%) were indecisive or disapproving of the materials. This level of disapproval could have been a possible contributing factor to the overall satisfaction rating of three of those participants, as because two of the participants had an overall dissatisfied

experience using Google Reader, while one had a neutral but slightly negative experience using Google Reader. This relationship may suggest that using a feature that does not provide the participants results that they do not find satisfactory can lead to an overall negative or dissatisfactory experience. In terms of engagement, it can also suggest that end-users may want to disengage less or not disengage at all in the future with this site, given a bad introductory experience.

4.2.1.3 “Browse for stuff” and Bundles

Google Reader’s “Browse for stuff” link provides the participant with an access point for “discover[ing] and searching[ing] for feeds.”¹⁵ End-users have access to browse through hundreds of bundles, search by keyword and by name (i.e., in the case of personal blogs), and to look at recommendations based upon the end-user’s established subscriptions. Considering the problems (discussed in the Site Navigation section, 4.2.1.1) that the participants had with adding feeds, those who used the “Browse for stuff” toolbar were more successful in their searches. When they searched for a “keyword,” results were generated that they either clicked on and added as a subscription or continued browsing.

Only eight used the “Browse for stuff” feature, but of those eight participants, none later indicated that they were dissatisfied with the system and the overall experience. In fact, five of the participants stated that they were satisfied with the overall system and the remaining three were classified in the neutral category.

The bundles that are found in “Browse for stuff” represent an extensive categorization of thousands of subscriptions. There are “featured” bundles, “bundles from Google,” topical bundles and, if an end-user had friends or contacts that created bundles, they could share them.

¹⁵ “Discover and search for feeds.” Google Reader. <http://www.google.com/reader> Accessed on March 15, 2011.

Essentially, bundles take multiple feeds and group them together so that they are located in a folder on the Subscriptions list. Google suggests that bundles are a “quick way to add feeds” to their subscription lists.¹⁶ For example, when one of the participants went to the “Browse for stuff” menu, he/she expanded the “News” bundle, which revealed a total of nine feeds that had sources ranging from international, national and local news sources. When the participant clicked, “+ Subscribe,” she had a new folder pop-up under her subscribed subscriptions list. Adding bundles allowed the participant too add the nine news feeds in one bundle; therefore, she saved time by not having to add nine feeds individually. From the sampled participants, only five participants (27.8%) added bundles to their subscribed materials. Three of the participants (16.7%) added three or fewer bundles, but two participants added several bundles based on their interests (e.g., 15 and 40 bundles, respectively).

Similar to the overall satisfaction responses seen with the “Browse for stuff” results, of the five participants who used the bundles, there were none who were later identified as being dissatisfied with the system and the experience. In fact, three of the participants were later identified as satisfied and the other two participants were later identified as neutral, neither satisfied nor dissatisfied with the experience. This data shows that the participants who were able to find and identify the features to accomplish their tasks were more likely to state that they had a positive or mostly satisfying experience using Google Reader.

4.2.1.4 Navigation to Primary Sites

RSS systems allow the end-user to navigate back to the primary source article through hyperlinks. Google Reader uses the title as an anchor for the hyperlink back to the original story. Depending on the Internet browser settings, the new story will open in a new tab or a new

¹⁶ “Discover and search for feeds.” Google Reader. <http://www.google.com/reader> Accessed on March 15, 2011.

window. For this study, Internet Explore was the only browser available on the lab's computers. Based on the browser's settings, when one of the participants clicked on the title, the story would open in a new window.

A majority of the participants (16 participants or 88.9%) stated that they found navigating from Google Reader to the primary site, through use of hyperlink, to be easy. Only one participant (5.6%) did not approve of how the site navigated from one system (Google Reader) to the story (primary source), for which she cited her unease with the new browser opening. She said that she would have preferred the site to open in a new tab. While the participant stated that she did not approve of the hyperlink mechanism, the browser's settings were primarily responsible for her disapproval. There was only one participant (5.6%) did not click on any of the hyperlinks and she said that she did not need to navigate outside of the system, because the articles she read were provided full-text in Google Reader.

Once at the primary site, only two participants (22.2%) moved from the article they had found inside of Google Reader to another article within the foreign website. As an example, one of the participants was reading about the Pittsburgh Steelers in Google Reader and she found an article (in Google Reader) and not only wanted to read the snippet provided, but the full story, as well. She clicked the article's title and navigated to the primary source of the article. Once the site loaded and she had read what she wanted of the full article, she continued to click links within the system. Therefore, she was reading more articles through extended hyperlink use. This behavior of following hyperlink trails echoes the definitions of browsing as Bates discussed in her 2007 article, especially related to "glimpsing" and an object, examining and then finding another object to replace the previous item.

Overall, the participants approved of the hyperlink navigation options because of its ease of use and their “familiarity” with other systems, citing search engines and social networks for establishing those familiarities. Participants expressed ease of use and comfort because of their existing familiarities of hyperlink systems. Because of their comfort with navigation, 17 participants (94.4%) used hyperlinks to travel from Google Reader to an articles primary source. This suggests that Google Reader’s use of hyperlinks was similar enough to other systems that the participants were able to “understand” how to interact with the system based on their learned interactions with search engines, social networks and other systems.

4.2.2 What browsing characteristics do the end-users exhibit while using Google

Reader?

As discussed in Chapter 2, browsing is “the activity of engaging in a series of glimpses, each of which may or may not lead to closer examination of a (physical or represented) object, which examination may or may not lead to (physical and/or conceptual) acquisition of the object” (Bates, 2007). To observe and analyze browsing characteristics, the researcher used Google Reader because of its stable platform web platform and its available functions. Using Google Reader, an end-user could subscribe and add his own desired materials, find recommendations based on his interests, share articles with his friends, keep track of what items he had read, interact with available multimedia (e.g., stories with videos, sound clips or GIFs), and navigate from the article in the system to the full article in the primary source, should the end-user desire.

4.2.2.1 Site Navigation

Google Reader has many features that enable users to “click” around the site, pages that present end-user usage data (Trends, Starred items, Shared items, Friends Shared items, etc),

pages that help the end-user find feeds of interest, and pages that recommend additional feeds for the end-user to use. To promote interaction with the system, the researcher assigned each participant the same two tasks.

The first task was to take 10 minutes and navigate around the site as though they had 10-free minutes to work on personal interests. The second task was to interact with Google Reader's functions by adding feeds or subscriptions, reading items and then "starring" them, and sharing or emailing articles of interests that they would share on social networks.

4.2.2.1.1 Adding Subscriptions

In Google Reader, end-users subscribe to RSS feeds in a variety of ways. They can use the "Add a Subscription" button, use "Keyword" searches, use "Recommended items" and "Recommended sources" to find feeds, they can subscribe to multiple feeds at once through bundle packages that Google Reader has created based on topics, people of interest and even end-users can make bundles to share with their friends.

With the exception of one participant (5.6%), 17 participants were able to add subscriptions to their Google Reader site, representing a 94.4% success rate. The range of subscriptions varied because five of the participants (27.8%) used bundle packages which greatly increased the amount of feeds that they were subscribed to; of those who did not subscribe with bundles, five to six subscriptions was normal, but for those who subscribed to bundles, the subscriptions varied from 9 – 280. As discussed earlier, those participants who used bundles to add their subscriptions were generally more satisfied and less frustrated with the system.

For those who did not subscribe to feeds using bundles or the "Browse for stuff" feature, there were many issues related to the usability of the search bars. On the left hand menu there is an "Add a subscription" button; this button will expand into a drop-down search bar when

“clicked.” To add an exact feed, it helps if the end-user knows or can copy and paste the URL into the search bar. If the end-user does not know the full URL, he or she can type in a keyword, which will return feeds that have the potential of matching the keyword.

Another feature available on every page is the search bar, above the center section where the articles display. The primary function of this search bar is not to add feeds, but rather to “search your feeds” and browse the existing feeds against the input search terms. Ten (10) participants (55.6%) used this search bar with the intention of searching for feeds. After they were unable to find the feeds that they wanted, many participants expressed “uncertainty” and “confusion.” These negative affective reactions contributed to their perceptions of Google Reader and they would subsequently describe the site as “difficult to use,” “unhelpful” and “dissatisfied” with their experience.

Additionally, several participants had difficulty deciphering when to use the “Add a subscription” button or the search bar. The search bar has a scroll-over or hover-over message that says, “Search your feeds,” but those who had complications with the site were too preoccupied by their feelings of “uncertainty” and “confusion,” feeling “freaked out” or “that I was dumb,” to notice. Of the 10 participants (55.6%) who used the search bar for finding feeds, only one person was successful in using it for its purpose of finding stories from feeds. Of the 10 participants (55.6%) who used the search bar, nine of those participants used both “Add a subscription” and the search bar to complete the task of subscribing to feeds. While participants indicated that they had experienced negative affective reactions while using the search bars, it did not necessarily suggest that they had an overall negative or dissatisfactory experience. In fact, of the 10 participants (55.6%) who had used the search bar, seven of the participants (38.9%) expressed that overall they were satisfied with their Google Reader experience, while

only two participants (11.1%) expressed neutral attachments and one participant (5.6%) expressed dissatisfaction. Initial difficulty with one of the tasks was not indicative of a negative experience, but rather a challenge that most of the participants were able to figure out without the assistance of a help menu.

Both ways of searching for data in the system promoted ways for the participants to browse and evaluate sources and articles. If a source was not what the participant had wanted, she had little problem navigating back to the search page or bar and refining or abandoning the search. In cases where the participant was uncertain of what feeds to add, she would navigate to the “Recommended items” to receive ideas for subscriptions or to subscribe to the source of the “Recommended item.” With such a variety of navigational paths to subscribe to articles, it’s no wonder that many of the participants expressed confusion and uncertainty with how to implement tasks, like adding subscriptions.

4.2.2.1.2 Adding Stars

Adding a “star” to an article in Google Reader is a way to mark the story as one you would like to keep, working like a browser bookmark. While it may have taken the participants a few moments to figure out where the “Star” was located on an article, all of the 18 participants were able to successfully complete the task, with an average of 5.3 stars per participant.

The idea of “starring” an item works well within Bates’ (2007) framework for glimpsing, sampling and selecting the article. Starring would also meet Kwasnik’s (1992) definition of place marking, by “marking a view for potential second consideration,” which he argues is a browsing activity. To further these assertions, participants used starring to complete the task, but a few indicated how it would be “nice” to return to articles for further viewing.

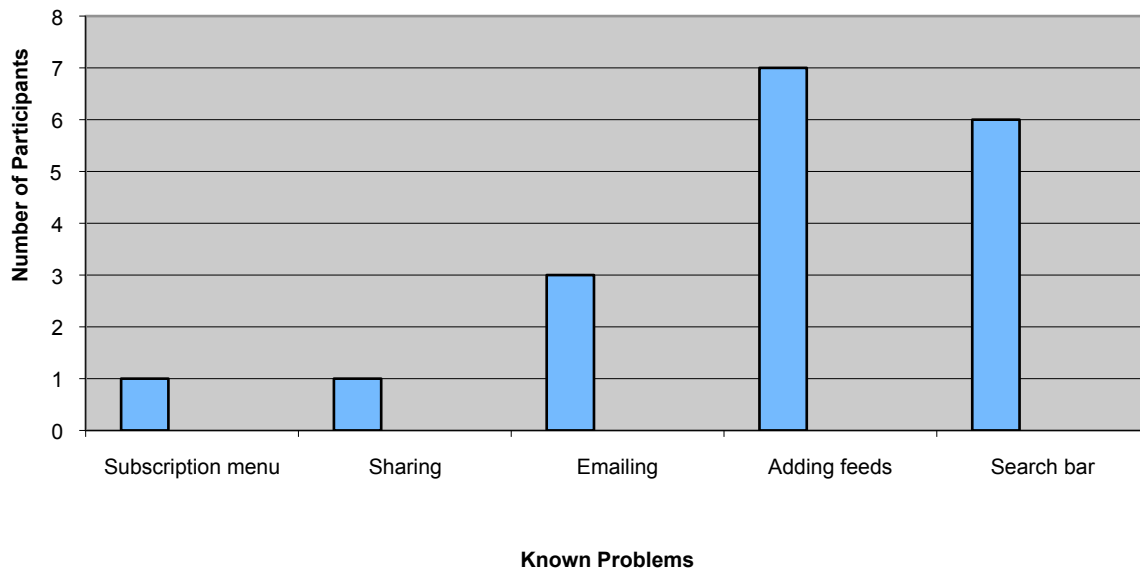


Figure 2. Issues encountered by participants

4.2.2.2 Attraction and Engagement

4.2.2.2.1 Attraction

Delving further into how participants use the system and how they browse for items, the researcher asked the participants what elements of an article attracted them to engage with the material and begin the process of browsing. Of the 18 participants, eight participants (44.4%) indicated that they were attracted to images over text, including titles. Seven participants (38.9%) stated that they were attracted to title. Two participants (11.1%) were attracted to the topicality or subject of an article and one participant indicated that they were attracted to the snippet of information or the content of an article.

To better understand why eight participants (44.4%) were more attracted to images and more engaged with articles that contained images, the researcher asked the participants to describe what elements attract them to an article. Responses varied, but one participant stated, “I

just don't love to read a ton of information. I guess, since I am in, no, was in the art department, that I'm getting my art minor that I'm just attracted to visual things more than like reading a long article or I don't know." While another participant stated:

I tend to look at those [photography blogs] more, because the way that my time is, I don't really have a whole lot of time to read articles and my brain is just kind of done with that after school and things like that. And I love photography and so it's fun for me. [...] So, I usually look at picture blogs, because it's easier for me to connect without having to read it and I have a story without having to read anything.

The popularity of images and time spent looking at photos and photography blogs was an unexpected result, because text, especially the title, is dominant in RSS and ATOM feeds. The researcher will discuss this further in future implications for future research related to attraction in the Chapter 5 section on implications.

4.2.2.2.2 Engagement

After having asked to discuss what elements of articles attract their attention, the researcher asked how long, in general, would it take for the participant to know whether the article would be interesting to them or not. The results were pretty well split among the four most common responses. All of the 16 participants (88.9%) who were able to respond to this question indicated that within two paragraphs, generally, they would be able to identify whether the article would be of interest.

Each participant who responded to the question about what elements of articles attract their attention had mentioned "interest" as being the driving force behind whether they would fully engage or commit to an article. When the participant would discuss this, the researcher would ask how they would define what interests them. A majority of the 12 participants (66.7%) indicated that interest has to have personal significance to them, their surroundings, or things that affect their lives or could potentially have an affect on their life. Similar to the previous

Attraction section, the researcher will discuss this further in section 5.2 Implications for Future Research.

4.2.2.2.1 Articles Viewed Versus Articles Read

The amount of articles that the participants viewed also varied. During their testing, the participants viewed, on average, 51.7 articles, with a range that varied from 16 – 115. Bundles did seem to correspond with higher articles viewed; of the five participants (27.8%), who used bundles, the average was 65 and the range was from 16 – 115. Having such a wide range with all of the articles viewed could suggest that participants scrolled more through the articles to find ones that they could engage with, while demonstrating Bates' elements of browsing. The participants all “sampled the field” of available items and “examined” various articles, but some participants kept browsing through the items to find articles of interest.

4.2.2.3 *Advertisements*

To raise revenue, Google Reader, like many other service providers, incorporates advertisements into their articles. Some of the advertisements are dependent upon the source; they include the embedded image in the XML format so that their subscribers will see their paid advertisers. Google, also, includes Google Ads in some of the articles.

The researcher reviewed and calculated all of the items the participants viewed during their session. On average, participants were exposed to 5.7 ads per session. For further analysis refer to Figure 2

When asked if the participants noticed any of the advertisements, 17 participants (94.4%) indicated that they did not notice any and ads were there, they had no influence on their overall browsing experience. Only one participant (5.6%) noticed the advertisements and she was the participant who saw the most articles; there were 25 ads seen on the 44 articles viewed.

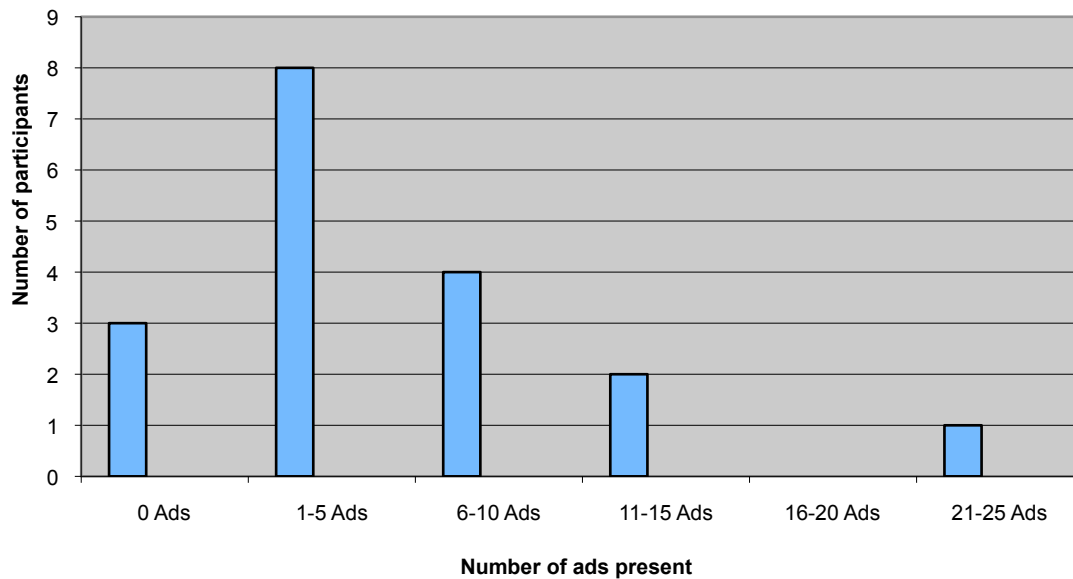


Figure 3. Ads in Google Reader Articles.

It is interesting to note that only one participant (5.6%) noticed advertising because it is visually inconsistent with the rest of the article. To understand this result, in context with browsing, the advertisements did little to “catch” the attention of the participants. If that first glimpse is not made, then browsing would be difficult to do. Browsing is dependent on the visual cues and interests and information seeking behaviors.

4.2.2. How do end-users experience levels affect their browsing behaviors when using Google Reader?

Based on the Google Reader usage data and the RSS usage data, there were no participants who can be defined as a frequent end-user. For this study, there were 17 non end-users (94.4%) and one infrequent end-user (5.6%). Because of the lack of representation from all of the end-user groups, this study will only look at the data from non end-user and the lone

infrequent user. This result was unexpected, because according to Sauers (2010), “It was estimated in 2005 that approximately 8.5 percent of Internet users used RSS to access information on the Internet. In 2010, that number was estimated to be more than 18 percent” (p. 138). Given those statistics, there should have been at least three people who could be considered frequent users, but because we did not have a wide-range of end-user levels, among the participant, this question could not be addressed within the scope of these research results.

Future studies should work to sample a broader group of end-users and end-user experience levels and evaluate whether those experience levels contribute to the levels of engagement in end-users who use RSS feeds or, specifically, Google Reader.

4.3 Affective States and Overall Satisfaction

During the exit interview, the researcher and the participants discussed how their interaction with the system, their potential issues with the system and how any issues they had affected their emotional states. At the end of the interview, the participants were asked if they were satisfied with their experience using Google Reader and then asked to explain their answer. Before the participant answered the question, the researcher recaptured the participant’s comments about the experience aloud with the participant and then asked the participant whether they were satisfied, mostly satisfied, neutral, mostly not satisfied or not satisfied with the system. Participants answered based on their perceived experience using the Google Reader. Overall, 12 participants (66.7%) interviewed stated that they were satisfied with the system; three participants (16.7%) stated that they were neither satisfied nor dissatisfied with the system; and the last three participants (16.7%) stated that they were dissatisfied with the system.

The three participants (16.7%) who stated that they were dissatisfied with the system cited issues with emailing the articles, adding the feeds or subscriptions, finding their already

added feeds in the system and the aesthetics of the system for their dissatisfaction. Their negative affective reactions outweighed their positive reactions; feelings of confusion, uncertainty and poor reactions to Google Reader's aesthetics or interface design dominated the coded reactions and relationships.

Overall, participants were mostly satisfied with Google Reader. While only six participants (33.3%) had little to no difficulty using the system, having problems or difficulty did not necessarily suggest dissatisfaction. Participants cited many factors to make their decision as to whether they were dissatisfied or satisfied with their experience with the system; aesthetics, novelty and how necessary they felt the system was or could be, ease of access to the information and how helpful the system was perceived greatly contributed to how much the participants engaged with the system.

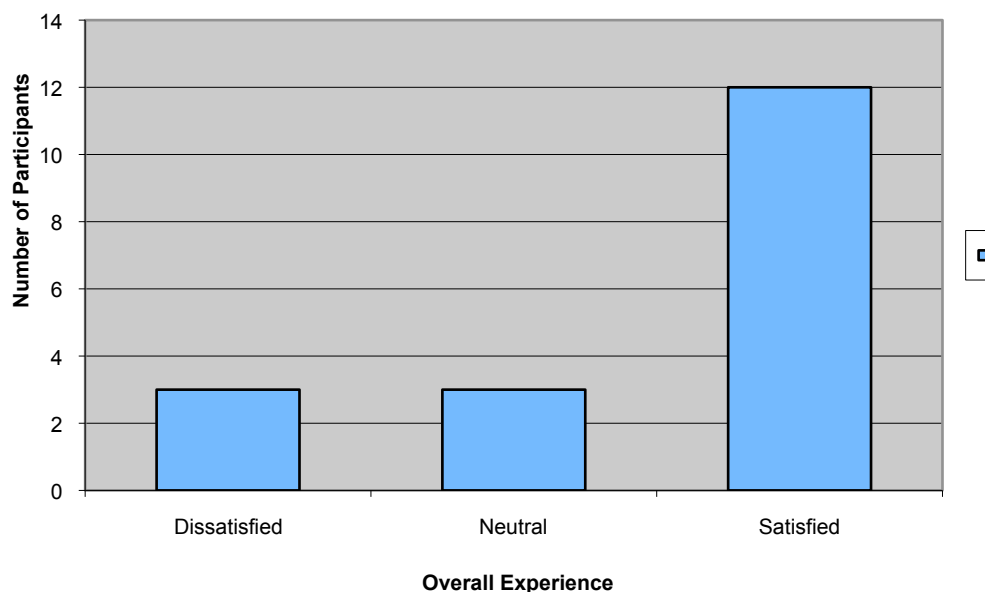


Figure 4. Participants' Overall Experience

4.4 Discussion

The researcher observed and analyzed how 18 participants completed two tasks using Google Reader as their primary system for browsing and reading articles. The participants were all female, between the ages of 20 – 21 years old and they were all full-time undergraduate students majoring in Communication Studies. When the researcher began this study, her researcher questions were:

1. How do end-users interact with Google Reader? What functions do they use?
 - 1.1 What browsing characteristics do the end-users exhibit while using Google Reader?
2. How do end-users experience levels affect their browsing behaviors when using Google Reader?

To answer the first question, “How do end-users interact with Google Reader? What functions do they use?” the researcher had the participants complete two tasks, one open task and one closed task. For the open task, the participants spent 10 minutes discovering the site by reading articles, adding feeds, navigating through the pages and reviewing the settings. The second task had a series of three sub-tasks that the participants completed by adding feeds, reading articles and marking them and sharing or emailing articles of interest with the researcher.

The researcher observed that the participants were inclined to use a variety of ways of accomplishing these tasks. The researcher noted that participants used many methods to complete Task 2, sub-task 1: Adding subscriptions. It was during Task 2, sub-task 1 that participants encountered difficulties in how to add subscriptions. While some participants found ways to quickly add multiple feeds through bundles, other participants struggled with the “Add a subscription” button and search bar. Problems with adding feeds did not ultimately suggest that

participants would find the system dissatisfactory; in fact, many were determined to figure out how to add feeds without the assistance of help menus. None of the 18 participants consulted help menus, but rather used trial and error to find solutions. Only one participant (5.6%) was unable to add any feeds and she cited difficulty and frustration as to why she abandoned the task.

Google Reader has multiple features and navigation paths that promote browsing. By allowing end-users to add their own subscriptions and to have access to recommendations based on their own feeds, the system keeps track of what the end-users have read and recommends items to keep the end-users engaged. While Google Reader may have a usability issues and a few features that are redundant or confusing for some end-users to use, the website can be manipulated by the user to find articles for browsing and engagement. The more usable the system and the fewer complications that the end-users experienced, the more likely they were to engage with the materials. This exploratory research recorded interesting findings, particularly regarding engagement with the system and how the participants conceptualized their experience. Similar to O'Brien and Toms' 2008, the participants' "experience of being engaged was perpetuated by the interactivity of the computer environment—sometimes physical, social, or cognitive—and the usability of the interface as they matched the users' attention, motivation, interest, and need for aesthetic and sensory appeal, novelty, control, and challenge." Participants engaged and enjoyed interacting with Google Reader when they felt that they had better understanding of the functions the site performed and they were able to successfully complete the task. For example, when in their last survey, "How did you feel about your ability to use the system?" participants, using a Likert scale, responding on a scale of 1 (not successful) and 5 (very successful), who felt moderately to very successful, were later associated with those who responded that they were "Satisfied" with the Google Reader experience; while those who

responded moderately unsuccessful and neither successful or unsuccessful were associated predominately with those who felt neutral about the experience or were dissatisfied. These findings relate and suggest similarities to those findings of O'Brien and Toms (2008) and Toms (2000).

Browsing behaviors were observed in the system. Considering Bates' proposed definition that "browsing is the activity of engaging in a series of glimpses, each of which may or may not lead to closer examination of a (physical or represented) object, which examination may or may not lead to (physical and/or conceptual) acquisition of the object," participants using Google Reader were observed using many of the same behaviors. While scrolling down a list of articles, a participant would see an article that "caught her eye" and she would continue to examine this article. If the article were only a snippet of the original story, she would "click" the title and navigate to the original page. Should the article be of interest and she wanted to keep the article, she could mark the "star" and bookmark the article for future use. In this study, the researcher observed that the participants were willing to browse for articles in Google Reader and read articles that interest them; they were willing and knowledgeable of how to proceed from an article within Google Reader to the article's primary source (e.g., the publishing website). Overall, Bates' proposed definition was not disproven by the study and suggests that many of its findings are valid in using an RSS system like Google Reader.

One of the interesting findings was related to what attracts participants to the articles that they choose to engage. Eight participants (44.4%) indicated that if an article had images they were more likely to engage with the article than just based on its title. Of those participants who were attracted by images, several of the participants indicated that they preferred to look at photos, photography blogs and visual elements as opposed to reading text. Another interesting

finding was related to the types of items the participants share on social networks, most often on Facebook; 10 participants (55.6%) stated that they prefer to post and share videos and multimedia-based items. This preference suggests that a majority of these participants were looking for convenience in accessing information. In an article discussing how individual viewers are adapting to e-book and e-journal technologies, Rowlands, et al., (2008) states,

The average times that users spend on e-book and e-journal sites are very short: typically four and eight minutes respectively. It is clear that users are not reading online in the traditional sense, indeed there are signs that new forms of 'reading' are emerging as users 'power browse' horizontally through titles, contents pages and abstracts going for quick wins. It almost seems that they go online to avoid reading in the traditional sense (p. 295).

As browsers continue to use electronic technologies and are exposed to these levels of fragmentation, it will be interesting for future researchers to understand the evolution of information behaviors, especially in systems that use audio and visual transcription software.

To answer the second question, "How do end-users experience levels affect their browsing behaviors when using Google Reader?" the researcher determined end-user experience levels through the questionnaire. Unfortunately for this study, the majority of the participants (17 participants or 94.4%) were non end-users of RSS technologies; therefore, the second research question on how end-users' experience levels affect browsing could not be observed or answered.

The findings of this study suggest that Google Reader is a system that end-users can use to browse for information related to personal interests, news or current events, hobbies, and other subjects. There were a few usability issues that caused problems for this study's participants, but having expressed difficulty with a task or a function of the system did not dictate dissatisfaction with the system as a whole. Participants could see advantages and benefits in using a system like Google Reader to help in finding sources to stay current with global,

national and local events. Generally, participants were able to use most of the functions after a few minutes of working with the system suggesting that the system had features that promoted learnability. The participants were also able to look at many items within a short span of time suggesting that the system had features that promoted browsing. Overall, this system, despite a few issues with usability, provided the opportunity for end-users to interact with information and the researcher was able to observe the participants' interaction and browsing behaviors and future studies will look to expand this research.

CHAPTER 5: CONCLUSIONS AND FUTURE RESEARCH IMPLICATIONS

5.1 Conclusions

Overall, a majority of the participants were satisfied with using Google Reader as a resource for finding articles and interacting with the content. The key findings presented below are divided into groups: findings about participants, findings about Google Reader, and findings about browsing and information behaviors.

5.1.1 Findings about the Participants

For this study, all of the participants were female, Communication Studies students from the University of Tennessee. All of the participants were between the ages of 20 and 21 years old at the time of testing. The researcher learned that only one participant (5.6%) had ever used an RSS feed before, indicating that 17 participants (94.4%) were non-users of RSS feeds. Similarly, the same participant who had used RSS before was the only participant who had used Google Reader, again indicating that 17 participants (94.4%) had never used Google Reader before this study's testing.

All of the participants were familiar with social networking; in fact, every participant (100%) stated that they had a Facebook account. Of the participants, only one participant (5.6%) stated that she did not use Facebook on an everyday basis; therefore, 17 participants (94.4%) stated that they use Facebook on an everyday basis. This finding shows that this group of participants was familiar with social networks and the majority used social networks on a daily basis.

5.1.2 Finds about Google Reader

Google Reader was the RSS feed reader chosen for this study, because it is a popular web-based site that can be used to read RSS and Atom feeds. The researcher was able to create user accounts for the participants to use during their tasks and each participant was able to log into the system successfully. As discussed in the previous “Findings on the Participants” section, only one participant (5.6%) had used Google Reader before volunteering for this study. When each participant logged into the system, she saw either one of two potential sets of introductory materials. The first set of introductory materials contained five articles pertaining to “Getting Started” in Google Reader. The second set of introductory materials had an abbreviated set of instructions and then linked to a series of “Recommended items.” All of the participants reviewed the introductory materials, but only 5 participants (27.8%) found the introductory materials helpful; in fact, 8 participants (44.4%) found the introductory materials not to be helpful and the remaining 5 participants (27.8%) found the introductory materials to be helpful, but not helpful enough. Because the majority of the participants stated that the introductory materials were not helpful, perhaps web designers should review ways to make the materials better suited to the system and its features.

When the researcher looked at what features the participants used, the most commonly used features were the “recommended items,” hyperlinks to the original article and the “Browse for stuff” feature. Thirteen (13) of the participants (72.2%) used the “Recommended items” feature while looking for feeds and for articles to read. Eight participants (44.4%) used the “Browse for stuff” feature and of those who used this feature, none of the participants later expressed or stated that they were “dissatisfied” with their Google Reader experience. Seventeen (17) of the participants (94.4%) used hyperlinks to navigate to the original article at its primary

source and 16 participants (88.9%) found it relatively easy to navigate from Google Reader to the primary source via hyperlinks.

There were participants who had issues with some of the features in Google Reader; in fact, only six participants (33.3%) expressed not having difficulty using any of Google Reader's features. The most commonly cited problems were related to adding the feed and knowing when to use the "Add a subscription" versus the top, center search bar. Even though 12 participants (66.7%) expressed having difficulty using some of Google Reader's features, none of the participants consulted the help menus for issues or problems that they faced during testing.

Most of the participants expressed that they were satisfied with their experience using Google Reader. Twelve (12) participants (66.7%) expressed that they were satisfied with the system; three participants (16.7%) expressed that they were neither satisfied, nor dissatisfied with the system; and the remaining three participants (16.7%) expressed that they were dissatisfied with their experience using Google Reader. For those three participants (16.7%) who expressed dissatisfaction with the system, they most frequently cited issues and complaints related to the aesthetics of the site and all three had issues with using the site's features (e.g., finding feeds, adding feeds and emailing the articles). For this study, the usability of Google Reader as a whole did affect the user's overall perception of their experience, but expressing difficult with the system was not sole factor influencing overall satisfaction.

5.1.3 Findings about Browsing and Information Behaviors

The participants were able to use Google Reader for browsing articles and finding articles that matched their personal interests. Each participant marked the items that they had read with a "Star." All 18 participants were successful in reading and marking the articles that they had read. During the exit interview, the researcher asked the participants what attracted them to the articles

that they read over the articles that they didn't read, eight participants (44.4%) stated that they were more attracted to images and that they were more likely to look at images or read articles with images. Seven participants (38.9%) stated that the article's title attracted their attention. The other three participants (16.7%) cited the topic or the content as to what attracted them to the articles that they read.

The researcher asked the participants to discuss what kinds of items they share or email on social networks. In their responses, at least 10 participants (55.6%) commented that they prefer to share YouTube videos or multimedia (e.g., songs, video clips, GIFs) with others and that they would rather share these multimedia elements than to post or share articles. The researcher proposes in the section 5.2 that investigation of social media as a tool for browsing and navigation should be researched further.

5.1.4 Concluding Remarks

Based on Bates' characteristics of browsing, as discussed in Chapter 2 and Chapter 4, Google Reader was highly usable as a source for browsing and navigating to find articles and sources of information that were of interest to the end-user. As opposed to the system studied in Toms' (2000) study, Google Reader allows the end-user to configure their own subscriptions and create bundles and folders for their subscriptions. Google Reader also allows for sharing among friends or Google contacts and for emailing and posting on social networks.

Overall, Google Reader provides a solid foundation for conducting an exploratory study to observe how participants use RSS feeds. The researcher proposes ideas and suggestions for future studies that could also use Google Reader. By expanding the scope of future studies, there is the potential for further research and analysis of information and browsing behaviors.

5.2 Implications for Future Research

5.2.1 Future Research

As previously discussed in Chapter 4, individuals are interacting with many different kinds of information in many different sites. While an end-user is on Facebook, he/she can be listening to music on Pandora or watching a show on Hulu, reading blogs and responding to text message on the smart phone. To keep up with the rise of growing technologies and how end-users interact with the systems and their information, future studies should evaluate browsing behaviors and information searching processes related to social networks and how end-users engage with social networks to receive and exchange information. While much research and time has been put into the areas of information behavior research, keeping up with the changes in technology remains a challenge for future research.

For this thesis, the researcher conducted an exploratory study to observe how end-users would interact with Google Reader. It was determined, based on Bates' definition (2007) and O'Brien and Toms' characteristics of systems that promote engagement, that Google Reader would be an appropriate system for a study of this nature. While this study produced interesting results, more could be done in the future to expand this area of research. By increasing the sample size, having equal proportions of men and women, and by accounting for age, future research could generalize about more ways in which end-users engage with information and further observe how they browse with articles and multimedia.

This study intended to observe how end-users of different experience levels interact with Google Reader. Unfortunately, the researcher was unable to recruit any frequent or many infrequent end-users. For future studies, the researcher suggests analyzing how experience levels affect browsing, especially related to repeat use. For example, Toms' 2000 study had

participants return for three visits for different tasks; Toms observed how these additional visits influenced the information behaviors, primarily browsing and engagement, of the study's participants. Similarly, a researcher could analyze how end-users interacted with Google Reader in subsequent testing dates to keep track of how many articles a day the participant was reading, starring, sharing and emailing. Additional testing would create richer data that could be analyzed and used to continue our understanding of information behaviors.

This researcher also suggests that future studies look at what kind of materials the participant is reading through the use of eye-tracking software. This research would provide more reliable data as to what items "catch the eyes" of the end-users and how much time they spend analyzing or reading articles. That type of data would not only help information scientists with understanding information behaviors, but it could help publishers, marketers and those involved in publishing or communicating data. Knowing the kinds of items that attract the attention and interest of users would allow those creating information through blogging, writing, editing, etc, to emphasize the details that would attract the end-users so that they would be inclined to continue and read.

This study did not consider how mobile use via smartphones could affect end-users. Because of the growing popularity and availability of smartphones, future research should look at how end-users browse on these mobile devices. As the technology becomes more mobile, information professionals should be aware of how end-users will interact with these mobile devices and look for and find information.

5.2.2 Implications for Web Developers and Information Professionals

Technology shapes how information is communicated between individuals, groups and organizations. Understanding the technologies that influence communication is important to understanding how the information is being received, used and exchanged.

Web developers influence how the information is presented. This study discussed how end-users interact with and engage with content. A majority of the participants were concerned with how easy it was to get to an article or to read more information at the article's primary source. The participants share content with others and want to share multimedia, videos, songs, and information with their social networks. This concern of access also led into discussions of convenience, because many participants cited convenience as a contributing factor in why they shared YouTube videos more than they shared links to articles. Understanding what attracts end-users to article, what keeps his/her interest, and what they expect in articles, websites, and interfaces should be paramount for anticipating and developing the newer technologies, so that the technological resources can become more intuitive for the end-users. If a website is not modern or does not reflect newer design, end-users could disapprove of the aesthetics and not engage with the content. To make a system usable, the primary concern should be whether the end-users could actually use the system to accomplish his/her tasks with minimal difficulty and maximum efficiency. Setbacks and usability problem can ultimately influence whether the end-user will perceive the site as satisfactory or not, therefore, web developers should continue research in the areas of usability to optimize their systems for clean, engaging systems that end-users want to use.

Browsing and information behaviors are just a few aspects of the many fields that information professionals study, but they are important to understanding how individuals are

engaging with information and identifying methods to improve information access and retrieval. If end-users expect content to be convenient, dynamic and instantly accessible, that could dictate what sources end-users will use and rely on for their information retrieval needs. This study shows that information professionals should continue to research these topics, because as technologies change and transform into more portable, ubiquitous devices that connect more and more people, the ways that end-users interact with the content will continue to evolve. Understanding the evolution of end-users interaction and engagement is paramount to learning how to communicate with their stakeholders by enhancing and redefining the ways that they manage and provide content through websites, social networks, Information Retrieval systems and databases, and the other technologies employed to communicate their organization's mission.

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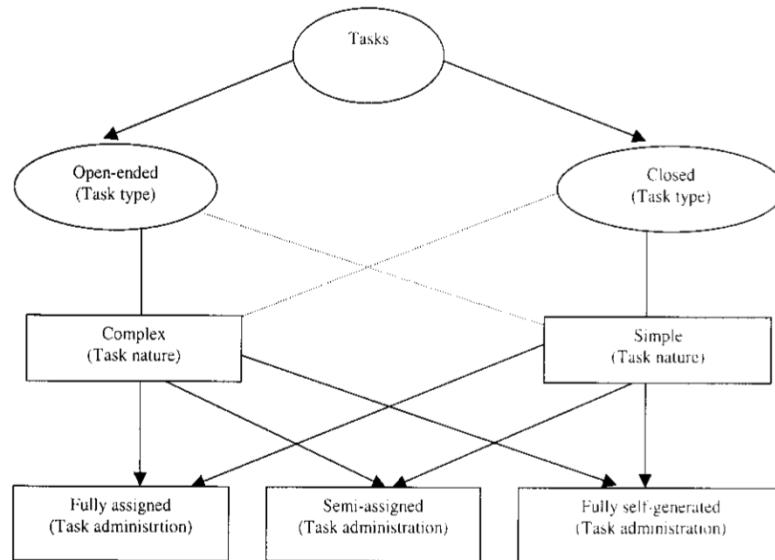
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APPENDIX

Appendix A

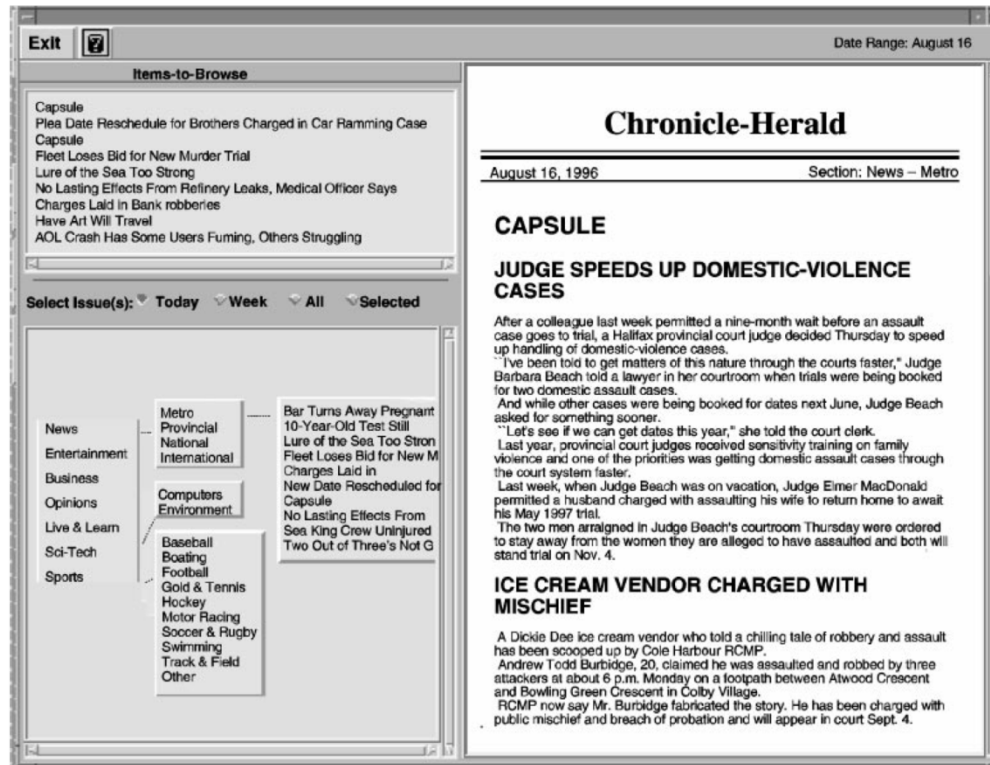
FIGURE 1. Bilal's Open and Closed Task Model



This is Figure 1 from Bilal's study (2002). It shows how tasks can be either open or closed and how their structure can either be fully assigned, semi-assigned or fully self-generated.

Appendix B

Figure 6. Toms' Browsing System



This is a screenshot from Toms (2000) study observing participants browsing habits in a system that contained current news articles. This image was taken from page 430 of the article.

Appendix C

TABLE 2. Toms' "Measures used to assess tasks"
Measures used to assess tasks

Measures	Instrument	Task	
		Implicit	Explicit
<i>Number of articles by Menu and Items-to-Browse:</i> number of articles selected overall and by source: from menus, or items-to-browse.	Audit trails	✓	✓
<i>Number of Menu choices used:</i> each second-level menu choice provided a list of articles; this measure was the number of article listings scanned.	Audit trails	✓	✓
<i>Time:</i> amount of time spent (1) examining and selecting articles from the menus or items-to-browse and (2) examining the contents of articles.	Audit trails	✓	✓
<i>Usability:</i> an aggregate of eight personal perceptions distilled from the Shneiderman's <i>Questionnaire for User Interaction Satisfaction</i> .	Usability assessment	✓	✓
<i>Exploration:</i> ratios of the number of unique articles and menu choices examined to the total number of articles and menu choices available. This measure indicates how extensively a newspaper issue was explored.	Audit trails	✓	
<i>Perception indicator (task-specific):</i> Implicit task: ratio of the number of articles that participants believed they examined to the total number in that issue. Trumbull, Gay and Mazur (1992) argue that this ratio indicates the extent of user disorientation. Explicit task: self-reported rating of the proportion of articles believed to be available on a topic.	Post-session questionnaire	✓	✓
<i>Mean session interest:</i> average user assessment of interest or informativeness using a five point Likert scale. The purpose behind serendipitous browsing is to unearth new ideas, facts, and so on. This is based on the assumption that something can be found to be of interest or to be informative in the newspaper.	Verbal protocols	✓	
<i>Novelty:</i> the ratio of articles on known topics to the total number of articles examined. How much of what was examined was unknown to the participant indicates the degree of novelty of the articles examined in the session. In general, successful browsing sessions are those which unearth new ideas and facts.	Verbal protocols	✓	
<i>Browsing environment preferences:</i> categorical variable that elicits user preference for control (or lack thereof) of the browsing environment.	Verbal protocols	✓	

This is Table 1 from Toms (2000) article, page 434. This table demonstrates how she divided the open and closed tasks, which instruments she used for each task and what and how the measurements were taken.

Appendix D

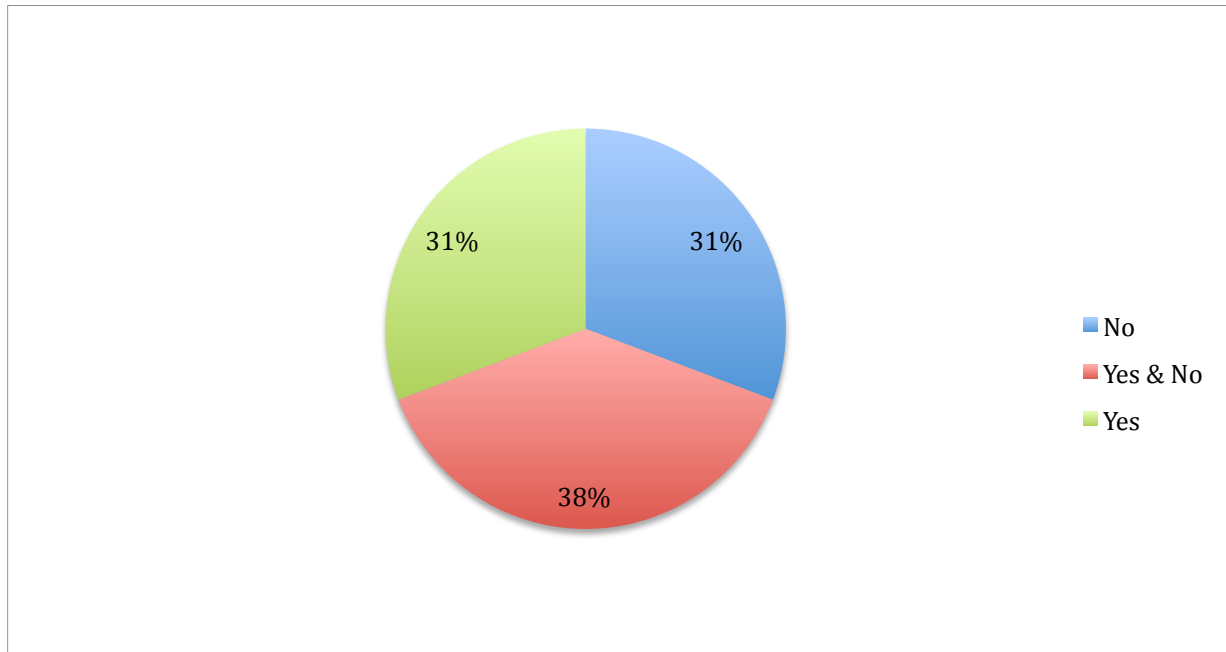


Figure 7-1. Introductory Material Helpfulness with Full Instructions

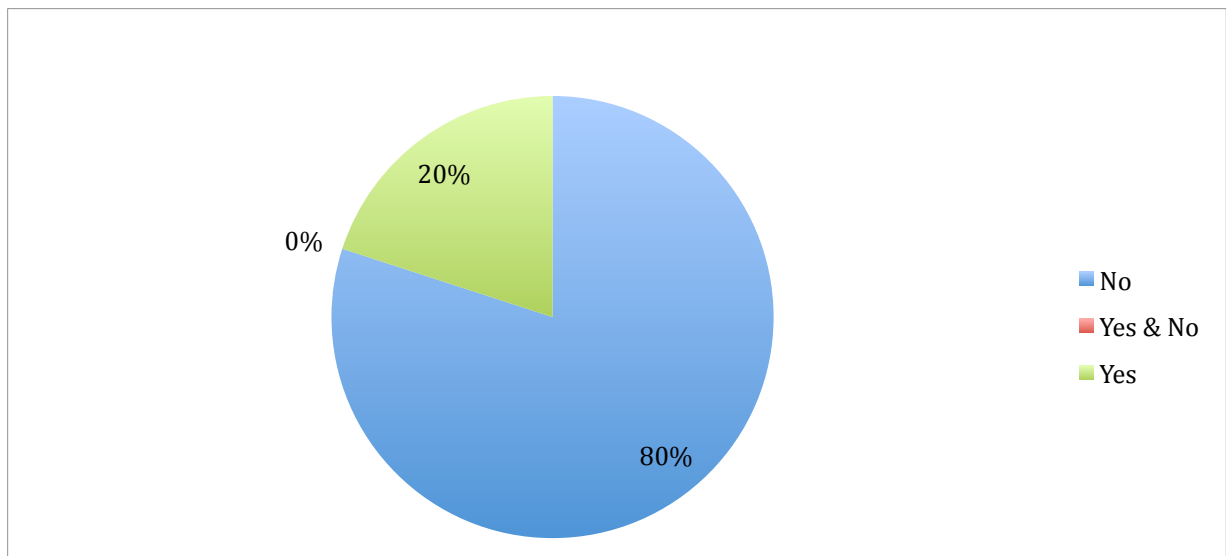


Figure 7-2. Introductory Material Helpfulness with Partial Instructions

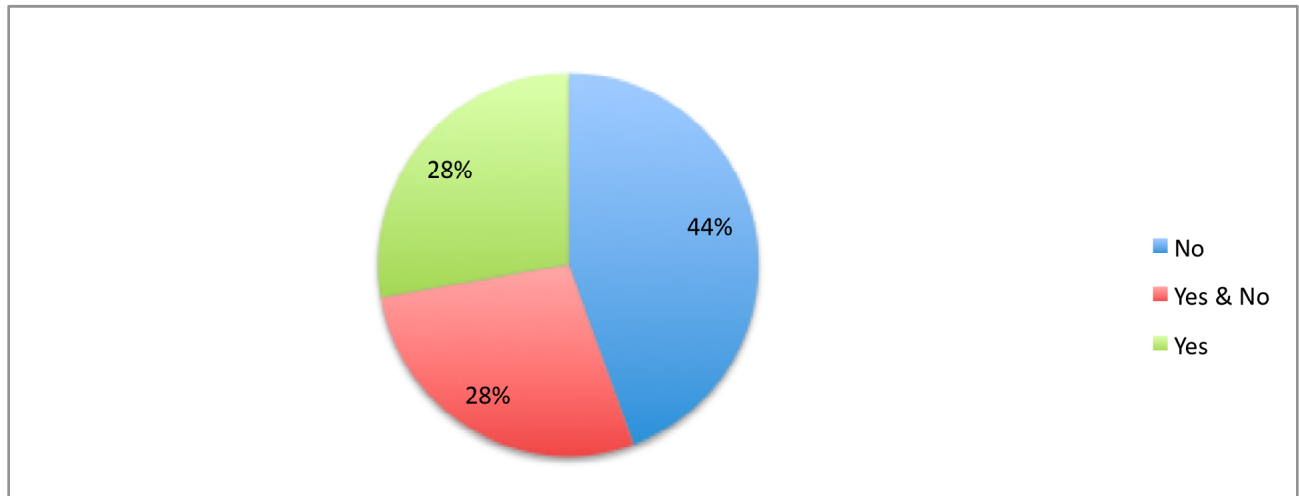


Figure 7-3. Combined Introductory Material Helpfulness

Figures 7-1, 7-2 and 7-3 indicate the percentages of the participants who found the introductory items helpful, somewhat helpful but not helpful enough or not helpful at all. The first figure, 7-1, depicts those participants who had access to all five articles. The second figure, 7-2, depicts those participants who only had access to part of the introductory materials and then were connected with the recommended items. The final figure, 7-3, depicts the combination of all of the participants and how they viewed the introductory items as a group.

Appendix E

Below are images of Google Reader. The images represent some of the functionalities of the Google Reader system as well as features the end-user can optimize based on their own preferences.

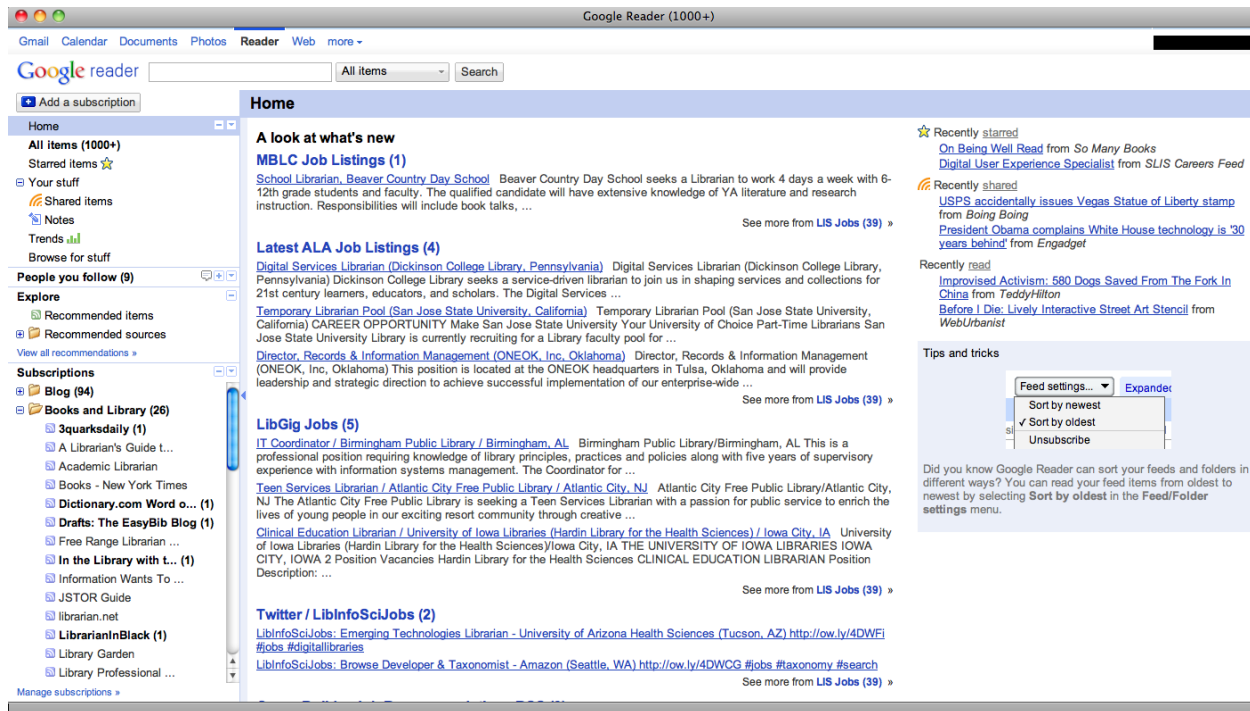


FIGURE 8 – 1. Google Reader Home Page Screen Shot

This is an image of Google Reader's main Home page. On the left, there are four different views. Navigation, Social Sharing, Exploration of system generation selections and all of the subscriptions the end-user has subscribed to. The main center portion is where the articles will display and in the right section are articles that have been starred for keeping, recently shared and recently read articles. All of the blue links are hyperlinks, which will route to the story within the system and additionally to the original story on the primary site. Clicking on any of the links on the left side will route the end-user to a particular view of the various content feeds.

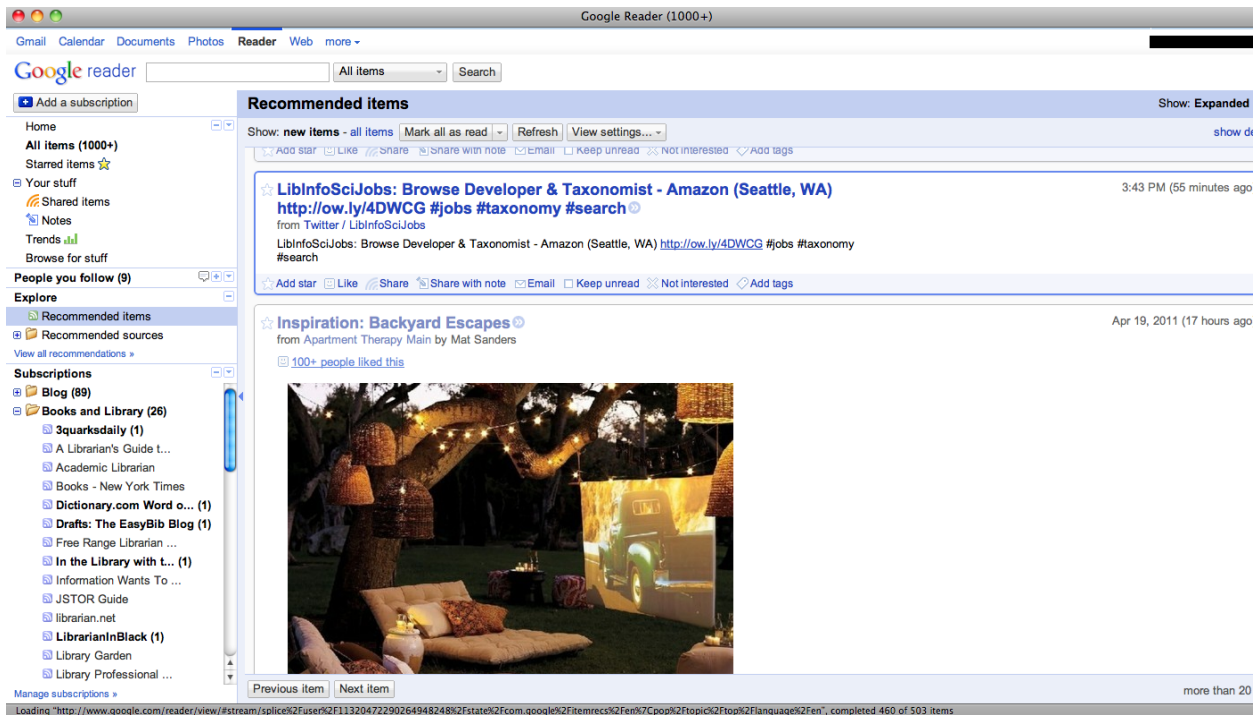


FIGURE 8-2. Google Reader Expanded Read Items Screen Shot

This image is of a view of the items once they have been selected. The item that is being read is boxed with a darker blue border, which indicates the content from this portion is being read. Note that multiple feeds can be grouped in folder and the end-user can read on a higher level (e.g., Books and Library) and read all of the articles available in the folder or go down the hierarchy and choose the specific source for article publication (e.g., 3quarksdaily).

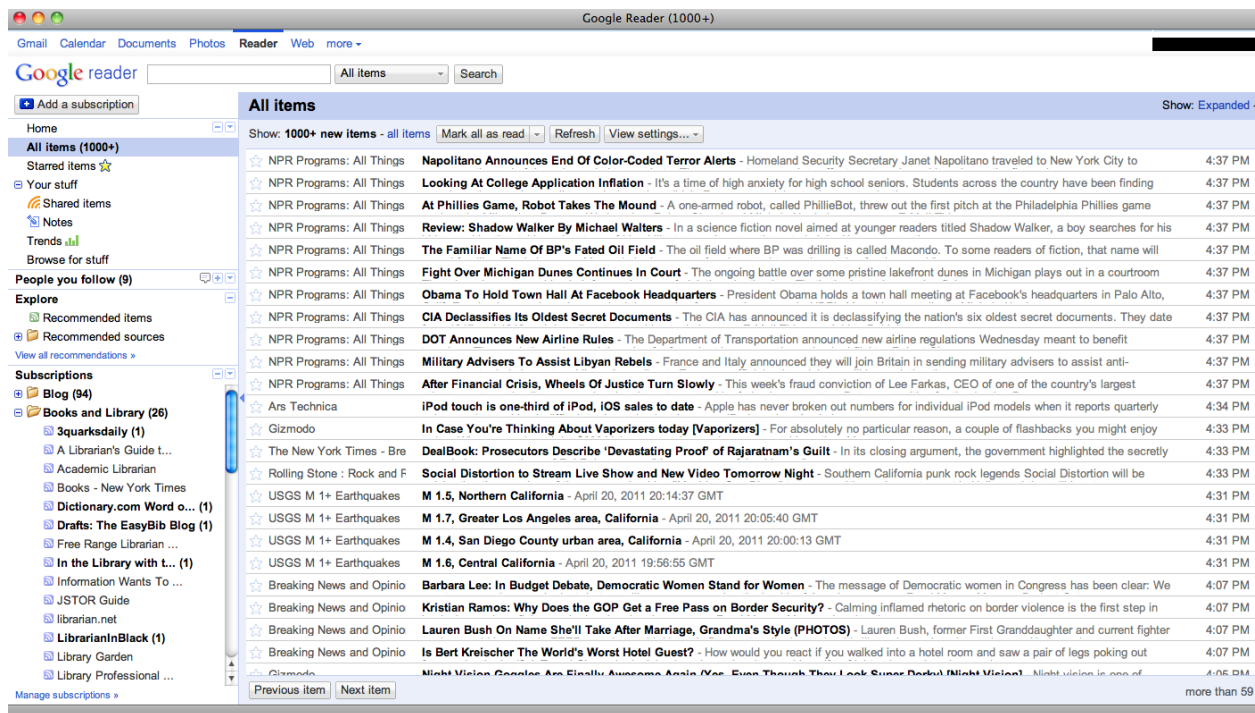


FIGURE 8-3. Google Reader List Item View Screen Shot

This is an image for how the articles are listed in the center content area. The end-user can choose whether to display the content as “Expanded,” which would show all of the metadata, images or content or to display the content as “List,” which shows the source, title first line of the content and time published. This image is the “list” view; images 2 and 4 are the “expanded” view.

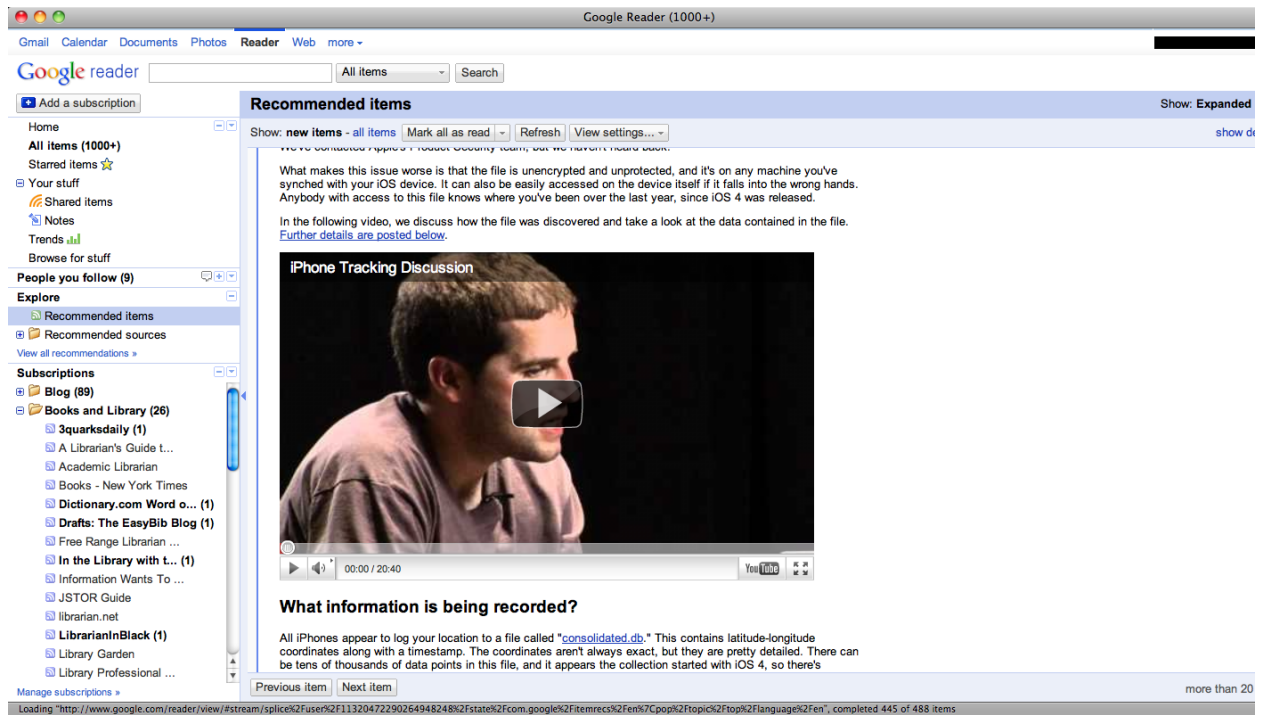


FIGURE 8-4. Google Reader Video Play View Screen Shot

This is an image of a video embedded into the Google Reader system. Note: this is in the “expanded” view.

Appendix F

INFORMED CONSENT STATEMENT

RSS Feeds, Browsing and End-User Engagement in Undergraduate End-Users

INTRODUCTION

You are invited to participate in a research study that is investigation how undergraduates interact with Really Simple Syndication (RSS) feed readers. You will be asked to discuss your background with various forms of technology in a questionnaire and you will then be asked to complete two tasks that use a feed reader and discuss that experience. None of the reports based on this experience will include any information that could reveal your identify.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY

You will participate in a study that will consist of an online activity where you will be using a RSS feeder and use its content. During the session, parts of your participation will be recorded with video and audio recording equipment. These recordings along with the data collected from the recordings will only be viewed and reviewed by the investigator. No other individuals will have access to these recordings and all data will be kept protected by the researcher. By signing this form, you agree to the audio and video recordings that will be conducted by the researcher during the course of the session. For this study, there will only be one session necessary required for your participation. The session is expected to last 1 – 1.5 hours.

RISKS

There are minimal anticipated risks to participants of this study. The researcher has worked to minimize all risks associated with privacy and data collection. You may choose at any time whether or not to participate in any part of the study or any line of questioning and you reserve the right to terminate the interview entirely. All of the data collected for this study will be securely kept and will not be accessible to others. Audio and video recordings will be used, but personal information from these recordings will be removed. The primary investigator will be the only individual with access to these recordings. The recordings will be destroyed after fully analyzed. You may request at any point to have the interview stopped and to have your recordings returned to you or destroyed.

BENEFITS

This research is exploratory and the results will be used to gather data concerning usability and information behaviors of undergraduates. Few studies have looked at how users engage with RSS feeds and this study looks to gain insight from the user interaction with the applications. The results will provide insights into end user interaction with RSS feeds. Any insight gained from this study will help the information science community better understand usability, information behavior and computer human interaction for undergraduate users.

_____ Participant's initials

CONFIDENTIALITY

The information in the study records will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study unless participants specifically give permission in writing to do otherwise. No reference will be made in oral or written reports that could link participants to the study.

COMPENSATION

For your participation in this study you will receive extra credit in your Communication Studies class. This has been discussed with your professor and you will be credited after you have completed the study's tasks.

EMERGENCY MEDICAL TREATMENT

The University of Tennessee does not "automatically" reimburse subjects for medical claims or other compensation. If physical injury is suffered in the course of research, or for more information, please notify the investigator in charge (M. West 865-898-6178).

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Mary Beth West, at 1345 Communications Building Ste 440, Box 65, by phone at 865-362-9378 or email at mross15@utk.edu. If you have questions about your rights as a participant, contact the Office of Research [Compliance Officer](#) at (865) 974-3466.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed you data will be returned to you or destroyed. By participating, you agree to the conditions of this study and you are at least 18 or older.

_____ Participant's initials

CONSENT

I have read the above information. I have received a copy of this form. I am 18 or older and I agree to participate in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix G

Questionnaire *(To be given prior to the Tasks; this will be presented as a computer-interface via MORAE. The blanks represented will be given as radio buttons, check boxes or text fields)*

Question 1:

What is your age? _____

Question 2:

What is your gender?

_____ Female _____ Male _____ Prefer Not to Answer

Question 3:

Are you a full-time student? *Yes / No*

Question 4:

How far along in your degree are you?

_____ 1st Year Undergrad _____ 2nd Year Undergrad _____ 3rd Year Undergrad

_____ 4th Year Undergrad _____ 5th Year Undergrad _____ 6th Year Undergrad

_____ 1st Year Graduate _____ 2nd Year Graduate _____ 3rd Year Graduate

_____ PHD Student

Question 5:

When you look at or read online content, either from the website or a RSS feed, what kind of content do you use? (Select all that apply)

_____ World News _____ National News _____ Local News

_____ Sports News _____ Sports Blogs _____ Tech Blogs

_____ Science News _____ Science Blogs _____

Question 6:

Do you know what a RSS feed is? *Yes / No*

Question 7:

Have you ever used a RSS feed? *Yes / No*

Question 7.A.:

If you answered yes, what system did you use to collect your RSS feeds?

Open-ended, there will be a textbox to answer

Question 7.B.:

If you answered no, can you think of examples of RSS feed collectors?

Open-ended, there will be a textbox to answer

Question 7.C.:

If you answered yes to using RSS, based on your past experience(s) using RSS feeds, how often have you used it?

- | | |
|--|--|
| ☐ Have Only Used Once | ☐ Once Every 2 – 3 Months |
| ☐ Once a Month | ☐ Once a Week |
| ☐ 2 – 3 Times a Week | ☐ 3 – 7 Times a Week |
| ☐ 1 Time a Day | ☐ 2 – 3 Times a Day |
| ☐ More than 3 Times a Day | |

Question 7.D.:

If you answered yes to using RSS, based on your past experience(s) using RSS feeds, how many hours per day do you use RSS feeds.

- | | |
|--|--|
| ☐ 30 Minutes – 1 hour | ☐ 1 Hour – 1.5 Hour |
| ☐ 1.5 – 2 Hours | ☐ 2 Hours – 2.5 Hours |
| ☐ 2.5 – 3 Hours | ☐ 3 Hours – 3.5 hours |
| ☐ 3.5 Hours – 4 Hours | ☐ 4 Hours – 4.5 Hours |
| ☐ More than 5 hours | |

Question 8:

Have you ever used Google Reader? *Yes / No*

Question 8.A.:

If you answered yes to using Google Reader, based on your past experience(s) using Google Reader, how often have you used it?

- | | |
|--|--|
| ☐ Have Only Used Once | ☐ Once Every 2 – 3 Months |
| ☐ Once a Month | ☐ Once a Week |
| ☐ 2 – 3 Times a Week | ☐ 3 – 7 Times a Week |
| ☐ 1 Time a Day | ☐ 2 – 3 Times a Day |
| ☐ More than 3 Times a Day | |

Question 8.B.:

If you answered 1 or more times a day, based on your past experience(s) using Google Reader, how many hours per day do you use Google Reader.

- | | |
|--|--|
| ☐ 30 Minutes – 1 hour | ☐ 1 Hour – 1.5 Hour |
| ☐ 1.5 – 2 Hours | ☐ 2 Hours – 2.5 Hours |
| ☐ 2.5 – 3 Hours | ☐ 3 Hours – 3.5 hours |
| ☐ 3.5 Hours – 4 Hours | ☐ 4 Hours – 4.5 Hours |
| ☐ More than 5 hours | |

Question 8.C.:

If you answered yes to using Google Reader, based on your past experience(s) using Google Reader, how did you consider your previous experience(s)?

- | | | |
|--|--|--|
| ☐ Highly Useful | ☐ Mostly Useful | ☐ Somewhat Useful |
| ☐ Useful | ☐ Not Very Useful | ☐ Not at all Useful |

Question 8.D.:

If you answered yes, based on your past experience(s) using Google Reader, how did you consider your previous experience(s)?

_____ Highly Engaging _____ Mostly Engaging _____ Somewhat Engaging

_____ Engaging _____ Not Very Engaging _____ Not at all Engaging

Appendix H

Handout presented before the participant started the tasks

Today you will interact with Google Reader. I will collect screen captures and observe as you walk through all of the tasks with a system called Morae.

To start a task, hit the button that says, “Start Task.”

Once you have finished a task, hit the button that says, “End Task.”

For any of the survey questions, if you cannot answer a question, you can proceed to the next question without answering. Once you have completed the survey, hit the button that says, “Done.”

If you had any unanswered questions, there will be a popup message that says, “You did not select an answer for Questions [...]. Would you like to answer them?” You can say “No.”

Please use the email and password provided on this instruction sheet to input into Google Reader.

Email Address: weststudy6

Password: #####

Note: You do not have to put “@gmail.com” in the address field, at the end of the email address; you can just put the name as it reads on this sheet of paper.

Appendix I

Introduction to study:

There are no right or wrongs associated with your activities. The purpose of this study is observation. There are a few tasks that you will be complete. Each task will be explained in detail. Before you start any task, hit the "Start" button and when you have completed the task hit the "End" button, these will be located near the instructions window.

At the end of the observation, you will be asked to discuss this experience with the primary investigator in an exit interview.

Instructions

Please open an internet browser and navigate to www.google.com/reader. Once the site has loaded, please use the handout that was given to you.

On the handout you will find a username and password. Enter the username in the email address field and the password in the password field. Once you have done so, please click "End Task."

Task 1

Once Google Reader has loaded, you will have 10 minutes to browse the site. Feel free to use any functions, modify the settings, and find any feeds for websites that you use frequently. You can read or look at any resources you feel like reviewing.

During this task, you should use Google Reader as if you had 10 minutes of free time to look at sites on the Internet, but use Google Reader as your primary system for looking at content from other sites.

At the end of the 10-minute period a survey will appear on your screen. Please complete this survey. Once you have finished the survey, you can click "End Task."

Task 2.1

If you have not already, please add at least five web resources or websites you use to your list of feeds. The web resources can be websites, blogs or any sites that you frequently use or are interested in using.

Once you have added at least five web resources, you can click "End Task."

Task 2.2

Once you have added at least five web resources or websites, find at least five stories of interest and read them (these stories can be from any of the feeds found in Google Reader). Mark the stories that you read with a star, also called "Starred Item."

Once you have marked the stories that you read, you can click "End Task."

Task 2.3

Once you have read at least five articles or stories, please share any of the stories that you might typically share with others (ex. Think about instances where you have posted a story or article on Facebook or another social network site).

You can share the items in Google Reader or send the stories to the investigator by emailing them to mbrwest@gmail.com.

Once you have shared or emailed the stories, you can click “End Task.”

Appendix J

Post Task Questions

Task 1 Post Task Questions

There will be a mix of Likert Scales (e.g., 1 being the worst/negative/disagree and 5 being best/positive/agree – will be elaborated on the actual questions) and closed and open-ended questions.

Was the site's layout familiar to sites you have used in the past?

Yes / No

How did you find navigating the site?

1 – Most Difficult, 2 – Moderately Difficult, 3 – Neither too Difficult nor Easy, 4 – Somewhat Easy, 5 – Mostly Easy

How did this site compare to sites you have used in the past?

1 – Most Difficult, 2 – Moderately Difficult, 3 – Neither too Difficult nor Easy, 4 – Somewhat Easy, 5 – Mostly Easy

How interested were you in the information or content presented?

1 – Not Interested at All, 2 – Not Interested, 3 – Neither Disinterested nor Interested, 4 – Somewhat Interested, 5 – Very Interested

Were you able to understand the features you saw?

1 – Difficult to understand all of the features, 2 – Difficult to understand some of the features, 3 – Neither difficult or ease experience with features, 4 – Understood some of the features, 5 – Understood all of the features

Please explain any features that were difficult to understand and why? (*Textbox*)

Please explain how you would improve these features? (*Textbox*)

Were there any features that you appreciated or enjoyed using? Please explain. (*Textbox*)

Did you look for or want to find any additional help features?

Yes / No

Were you able to find the solutions that you wanted or did you give up the search? Please explain. (*Textbox*)

Appendix K

Task 2 Post Task Questions

There will be a mix of Likert Scales (e.g., 1 being the worst/negative/disagree and 5 being best/positive/agree – will be elaborated on the actual questions) and closed and open-ended questions.

How well did you feel about your ability to use the system to complete the given tasks?

1 = Not successful at all, 2 = Somewhat unsuccessful, 3 = Neither unsuccessful nor successful, 4 = Somewhat Successful, 5 = Completely Successful

How engaging were the system features?

1 = Not at all engaging, 2 = not engaging, 3 = Neither Engaging or Not Engaging, 4 = Somewhat Engaging, 5 = Very Engaging

Did you find any features difficult to use?

Yes / No

Please explain any features that were difficult to use and why? (*Textbox*)

Did you find any features difficult to understand?

Yes / No

Please explain any features that were difficult to understand and why? (*Textbox*)

Please explain how you would improve these features? (*Textbox*)

Were there any features that you appreciated or enjoyed using?

Yes / No

Please explain any features that you enjoyed using. (*Textbox*)

Did you look for or want to find any additional help features?

Yes / No

Were you able to find the solutions that you wanted or did you give up the search? Please explain. (*Textbox*)

Overall, how would you consider your experience using Google Reader? (*Textbox*)

Appendix L

Exit Interview *(To be administered after the completion of both tasks)*

Scripting: This will be where the researcher thanks the participant for completing the two primary tasks. She will thank them for volunteering their time and will say that she just has a few extra questions regarding their experience using Google Reader. She will advise them if they are uncomfortable with any question or any part of the interview they can discontinue at any point and, also, she will remind them that this portion of the interview will be recorded.

Have you used the Google Search Engine before? How often?

How did this compare to that experience or those experiences?

Have you used Gmail before? How often?

How did this compare to that experience or those experiences?

Did the features from Google and Gmail contribute to how you moved through and used Google Reader?

How often do you use the internet a day?

For school?

For free time?

What attracted you to the articles that you read over the articles that you did not read?

Did the title or the subtext attract you to the story?

Were you inclined at any point to navigate away from the Google Reader system to visit the original story, especially if only a snippet or short blurb from the story was used?

Why did you or didn't you navigate in those situations?

Were there any elements (e.g., video, text, graphics, embedded music clips) that led you to review an article over another article?

Do you recall the "Explore" section of the Google Reader interface? If so, were you at any point inclined to use the "Recommended sources" feature provided by Google Reader? Why or why not?

Were there any particular reasons why you liked or shared the articles that you did? Were they of personal interest or do you think that some of your hypothetical friends or social network would be interested in these stories, too?

In the future, if you were to use the system, would you want ways to organized? Like tagging items or having folders to collect certain kinds of feeds?

With the items you shared, would you like to share them on other sites like Facebook, Delicious, Reddit, Twitter, Tumblr, etc?

Did you notice advertising with any of the content that you read or browsed? Was the advertisement distracting or did it take away from your overall experience?

You had mentioned in your Post Task 2 Answer that you would have rated your experience as ____ (*dependent on answer, researcher will observe*), would you be able to further elaborate on this?

Were you able to find the solutions that you wanted or did you give up the search? Please explain.

Were the videos or site introductions helpful? Why or why not?

Did you want to find more information on how to use the site, but not know how to find it or where to look?

Please explain any features that were difficult to understand and why?

Could you figure out what “starred item” meant? And the other left hand items?

Please explain how you would improve these features?

Were there any features that you appreciated or enjoyed using? Please explain.

Are there any other ways or benefits that you could think of that you would receive from using Google Reader?

What about negatives?

What if you were able to get feeds from school? Would you do that? Use those?

Overall, considering all of the tasks completed and your responses (provide examples for some of the responses), how would you consider your experience using Google Reader?

“So, as we conclude this interview, I just want to summarize what I have learned today. [Interviewee’s name], you were able _____. You seem to favor using - _____. You think that you would use this resource if you _____. Is all of this correct? Well, thank you again for your time and I appreciate the opportunity given to work with you today. Let me know if you have any additional questions now or in the future. I hope you have a wonderful day.”

VITA

Mary Beth West was born in Cartersville, GA. She graduated from Woodland High School of the Performing Arts in Cartersville, GA with the Performing Arts Seal. After graduation from high school, she attended the University of Georgia in Athens, GA. She graduated with a Bachelor of Arts degree in English and minors in Religion and Spanish. After graduating from the University of Georgia she moved to Knoxville, TN and worked for Travelers Insurance until 2009. She has been married to Chris West since August 2008.

She will receive her Master of Science degree from the University of Tennessee.