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The active audience of the weblog format

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WEBLOG FORMAT

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Abstract

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Through interviews and a survey, this thesis examines blog reading along several dimensions, including motivations for reading weblogs, audience interaction with the weblog format, and the use of tools to find and keep track of blogs. It proposes a typology of 'audience activity' based on the structural features of the weblog format, which includes the navigation of, contribution to, and promotion of blog content. It identifies reading behaviours, impediments to audience activities, and ways that readers judge the credibility of blogs. This research serves to inform the design of tools that interface with the blogosphere, and it provides a foundation to help software developers to harness different types of audience activity.

Acknowledgements

Contents

1 Introduction

The purpose of this thesis is to add to the literature on blog readers, and thereby to inform the design of tools for interfacing with the blogosphere. Additionally, this research helps bloggers to generate the audience activity that they want, and software developers to harness different types of audience activity. The thesis addresses the following research questions:

1. How do readers interact with blogs? What are the motivations for and impediments to their interaction?
2. What behaviours do readers report and exhibit in finding and keeping track of blogs?
3. How can current technologies/tools for finding and keeping track of blogs be improved?

1.1 The impact of the blogosphere

The blogosphere is the totality of blogs and their interconnections. Estimates suggest that in 2007, 50% of US internet users (94.1 million) read blogs, and 12% (22.6 million) authored blogs (Verna, 2008). In 2008, other estimates suggested that 77% of active internet users worldwide (346 million) read blogs (White & Winn, 2008). Technorati, the leading blog search engine, has published its "State of the Blogosphere report" annually since 2004. In 2008, Technorati began to survey bloggers "about the role of blogging in their lives, the tools, time, and resources used to produce their blogs, and how blogging has impacted them personally, professionally, and financially" (White & Winn, 2008). In 2009, they looked at "professional blogging activities, brands in the blogosphere, monetization, twitter & micro-blogging and bloggers' impact on US and World events" (D. Olsen, Berlin, E. Olsen, McLean, & Sussman, 2009).

Political blogs serve as a counterpoint to the mainstream media, and bloggers influence mainstream media coverage. In one instance, the political blogosphere caused then Republican majority leader Trent Lott to resign over having voiced support for the pro-segregationist Strom Thurmond (Gill, 2004). During the 2008 U.S. primaries Hillary Clinton and Barack Obama were mentioned the most in the blogosphere. Wattal et al. found that blog mentions had a

significant impact on Gallup polls, while traditional media, web 1.0, YouTube and MySpace did not (Wattal, Schuff, Mandviwalla, & Williams, 2009).

The blogosphere exists because the weblog format enables internet users to publish their writing (and pictures and videos). The ease of publication entails freedom from censorship and from the influence of media barons like Rupert Murdoch and Conrad Black. As concerns about the mass media in a democracy, censorship and editorial control are naturally replaced by concerns about the lack of journalistic standards and the potential bias of bloggers.

These concerns point to the importance of checking what bloggers say, as Dan Rather found out on September 8, 2004 after he reported on documents that seemed to show that George W. Bush had evaded the draft. The blogosphere quickly determined that the documents were forgeries, and the "Rathergate" incident led to Rather's resignation from CBS (Eberhart, 2005, para. 1).

More recently, an employee with the U.S. department of agriculture named Shirley Sherrod was asked to resign because of a video posted by blogger Andrew Breitbart, which portrayed her out of context as racist. Fox News repeatedly aired the video and branded Sherrod a racist. She was vindicated when CBS reported on the rest of the video tape (Champ, 2010).

At present, "China's leaders are under constant pressure now to be more assertive by a populist- and nationalist-leaning blogosphere, which, in the absence of democratic elections, is becoming the de facto voice of the people." Chinese bloggers are even being courted by the US Embassy in Beijing (Friedman, 2010, para. 1).

What is special about the blog format that facilitates this kind of impact? While we must acknowledge the impossibility of differentiating between technological evolution and cultural (political) evolution, it behoves us to look in more detail at the blog format, at its past, present and future, and at what interactive possibilities it affords to its audience.

1.2 The weblog format

Weblogs—commonly called blogs—are essentially dynamic, update-able web pages authored by one or more individuals whose 'posts' are displayed in reverse chronological order. Most blogs allow readers to leave comments and have links to other blogs and other websites. Herring et al. describe the weblog as "a socio-technical format, open to multiple uses," with the potential to render obsolete any "hard-and-fast distinction" between the web and computer-mediated-communication (CMC) (Herring, Scheidt, Wright, & Bonus, 2005b). This idea is embodied in the blogosphere, which may be thought of as a graph with individual weblogs as nodes and hyperlinks as the edges connecting them. In this respect, the blogosphere is analogous to the World Wide Web:

Blogosphere : World Wide Web

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Weblog : Website

Blogs exist in an ecosystem of internet media formats, including Social Network Sites (SNS), Forums, Email discussion threads, GoogleWave[1], Instant Messaging (IM), Twitter, and others. In 1977, McLuhan described the practice of "media ecology" as "…arranging various media to help each other so they won't cancel each other out, to buttress one medium with another." McLuhan suggests that "you can do some things on some media that you cannot do on others. And, therefore, if you watch the whole field, you can prevent this waste that comes by one cancelling the other out" (S. McLuhan, M. McLuhan, & Staines, 2004). Media ecology begs an understanding of what each medium can do—how they affect the content they transmit, and how users interact with and through them. For instance, Wijnia asserts that weblogs are not ideal for coordinating action and making appointments, or co-authoring a document; better suited are email and wikis, respectively (Wijnia, 2004).

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[1] Here is a link to a video explanation of Google wave: http://www.youtube.com/watch?v=p6pgxLaDdQw

Herring et al. found that early scholarly work on blogs had underemphasized their importance as individualistic, intimate forms of self-expression (Herring, et al., 2005b). Blogs feel like "a more private area" despite their public nature, because they are the domain of an author with editorial control, for whom the blog is a sort of avatar (Andreasen, 2006).

Yet the format lends itself to a variety of uses. In early 2000, the blog was being appropriated by politicians as a means of communicating with their constituents. Howard Dean's *Blog for America* was the first candidate blog. By September 2003 it received 30,000 visitors per day. Dean's blog was successful because his campaign recognized that the blog was a format that engendered participation; Dean's supporters valued the chance to feel involved, even if they did not receive a direct response (Kerbel, & Bloom, 2005). Dean's successful use of the blog points to the importance of the interactive affordances of the format in drawing and maintaining an audience.

The weblog format is open to social and technological innovation. Many websites have a blog which serves as a way for the website's administrators to communicate with the website's audience and for its audience to respond. Blogs have been used in education, as a means for the teacher to broadcast information, or as avatars for students to use in discussions (Andreasen, 2006). In corporate contexts, blogs have been used internally for knowledge sharing, and externally for communicating with clients, improving contacts and building loyalty (Andreasen). Blogs are also used in healthcare, for instance by support groups (Chung & Kim, 2008).

The variety of uses of the format underscores the importance of understanding how the format has been and can be successfully appropriated. Community blogs are one of the best examples of a successful, innovative appropriation of the format. Community blogs are collective creations wherein the line between bloggers and readers is blurred. Metafilter and Slashdot are

community blogs which function as recommender systems[2] because of their emergent culture. Their collaborative filtering is similar in utility to the link aggregation that characterized the early hand-coded weblogs.

There are websites that may be thought of as descendents of the weblog, such as Digg and Delicious, which function as collaborative filtering recommender systems for content, including blogs and blog posts, by allowing readers to post, discuss, and vote up the content they like. Websites like Digg help to support artists who use weblogs as a storefront, in a sense. Because it is a great way to discover and promote content, Digg is an "important tool for bloggers and other content providers who can't take out full page ads in the Times. If you're lucky, and have written a good post, it may get submitted to Digg, voted up and made popular, and you will have gained many new readers" (Wallstats, 2009, para. 3).

1.3 The literature surrounding blog readers

Motivations for reading blogs have been explored through online surveys (Chung & Kim, 2008; Huang, Chou, & Lin, 2008; Kaye, 2005), through surveys with open-ended questions (Karlsson, 2006; Kaye, 2006) and through interviews (Baumer, Sueyoshi, & Tomlinson, 2008). None of the research on motivations for reading blogs distinguishes pure readers from readers who are also bloggers. We do not know to what extent the research to date reflects blog users versus blog readers. This lack of distinction is problematic because some of the motivations for reading blogs are necessarily related to motivations for authoring blogs (Schmidt, 2007).

Some studies which looked at motivations for reading blogs also looked at predictors and outcomes of those motivations. Huang et al. looked at which motivations predicted opinion acceptance, interaction and word-of-mouth intentions (Huang et al., 2008). Kaye et al. looked at the demographics (Internet experience, gender, age and education), attitudes (feelings of self-efficacy, interest in current events, trust in the government, political attitudes, and political

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[2] A **recommender system** is an information filtering technology that attempts to present the user with information that is likely to be of interest to her. Recommendations are typically made by an algorithm referencing a profile of the user, and some characteristics of the information (content based) and/or metadata applied by similar users (collaborative filtering).

involvement), and usage habits (number of hours per week spent on weblogs and weblog participation) associated with different motivations for reading blogs (Kaye, 2005). Chung & Kim identified factors that predict gratifications obtained from reading cancer blogs: hosting one's own personal cancer blog, the perceived credibility of blogs, and posting comments on others' blogs (Chung & Kim, 2008).

These studies of readers' interactions with blogs are not comprehensive, and they do not focus on the interactive affordances of the weblog format. To better understand why and how blog readers interact with blogs, this thesis poses three research questions:

1.4 Research Aims and Justification

RQ1: How do readers interact with blogs? What are the motivations for and impediments to their interaction?

To begin to answer this question, I create a typology of the interactive affordances of the weblog format. A typology is "a conceptually based classification of objects based on one or more characteristics" (Hair Jr., Black, Babin, & Anderson, 2010). Ruggiero suggests that "a typology of uses, although not providing what some scholars would consider a refined theoretical perspective, furnishes a benchmark base of data for other studies to further examine media use" (Ruggiero, 2000).

This thesis also undertakes to confirm the prevalence of four motivations for reading blogs: expression and affiliation, convenience, information and entertainment.   The purpose of studying the motivations of blog readers is to a) understand what (if anything) is unique about what the weblog format offers to readers, and b) to compare readers' motivations for reading blogs with the actions they take in reading them. In particular, links have been found between the intention to share blog posts with others and reading blogs for expression and affiliation (Huang et al., 2008), between weblog participation and expression and affiliation (Kaye, 2005), and between the amount of time spent reading blogs and many motivations for reading them (Kaye, 2005).

A typology of Audience Activity has practical applications for appropriating and adapting the weblog for specific purposes. In addition, such a typology can serve to inform the design of new tools for navigating the blogosphere. Readers use tools that interface with the blogosphere in order to find and keep track of blogs; researchers are interested in improving such tools and designing new ones. Thinking of the design of tools for interfacing with blogs, Baumer and Fisher lament that "little blog research includes readers, and none focuses on reading practices and strategies" (Baumer & Fisher, 2008). Hence, this thesis also asks:

RQ2: What behaviours do readers report and exhibit in finding and keeping track of blogs?

Many researchers have conceived, and, to some extent, implemented new tools for navigating blogs and the blogosphere (Baumer & Fisher, 2008; Campbell, Fouché, & Weiss, 2005; Indratmo, & Gutwin, 2008; Java, Kolari, Finin, Joshi, & Oates, 2007; Schuff, Turetken, & Asif, 2010; Tauro, Ahuja, Pérez-Quiñones, Kavanaugh, & Isenhour, 2008). Supplementing the typology of Audience Activity, data concerning how readers find and keep track of blogs will be of value to these and other researchers. This thesis concludes by addressing the following research question:

RQ3: How can the current technologies/tools for interacting with blogs be improved upon?

Different interfaces, or even entirely different tools, could be designed for different types of users. It is unlikely that any tool will have an interface that is appropriate for every user. Consider that some needs may be incompatible, for example a novice's need for an intuitive interface, as compared with an expert's need for depth and breadth of functionality. Readers have differing needs, motivations, and usage habits; accordingly, they will benefit from different tools. Tools for interacting with blogs should better facilitate or enhance the gratifications that readers obtain from them, allowing readers to make better use of the blogosphere.

1.5 Benefits to stakeholders

There are six stakeholder groups which stand to benefit from this research: bloggers, organizations wishing to appropriate the weblog format, designers of tools for interfacing with blogs and the blogosphere, society at large, academics interested in media ecology, and blog readers themselves, who will benefit from this research by virtue of the benefits to the other stakeholders.

Understanding how and why readers interact with, find, and keep track of blogs is important for all bloggers, but especially for professional bloggers, because blog readers contribute to their livelihood. The results of this thesis can help bloggers to generate more and more fruitful interaction, and to better promote their blogs.

Organizations considering using the weblog format can similarly benefit from this research. A typology of weblog Audience Activity can help to decide if the blog is the right medium for their purposes, for both external and internal communicative goals. Externally, organizations use blogs to communicate with customers regarding new products and services. The research developed in this thesis can help such organizations to generate and harvest customer feedback. Internally, organizations wishing to design intra-office communities – e.g., for knowledge sharing – will benefit from understanding why and how readers interact with blogs. For instance, Ip and Wagner suggest that "roles" such as "storer", "linker" and "lurker" may be identified and leveraged in such communities (Ip, & Wagner, 2008).

Many researchers are interested harnessing the potential of blogs to act as a "well-functioning public sphere… for pluralistic decision-making at many levels ranging from small organizations to society at large" (Schuff et al., 2010). Pluralistic decision-making requires that "as many users as possible [can] add to the conversation in a meaningful way" (Schuff et al.). This endeavour will benefit from an understanding of the barriers to audience participation, how it can be encouraged, and the different kinds of audience activity that can be harnessed to foster "deliberative discourse", in the Habermassian sense (Cukier et al., 2009). Moreover, such a goal

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will benefit from an improved understanding of how readers judge the credibility of blogs/bloggers they may consider reading.

Similarly, readers suffer from information overload, which is a significant threat to gaining comprehensible information from (Cukier, Bauer, Ngwenyama, & Middleton, 2009). Schuff et al. believe that "the inherent challenge of the mechanisms designed to interact with the blogosphere is balancing exposure to blog content with the information overload such exposure creates" (2010, pp. 98).

This thesis contributes to the understanding of how readers experience information overload by investigating how different tools ameliorate and/or inadvertently exacerbate readers' experience of different kinds of information overload.

As said earlier, tools for interfacing with blogs and the blogosphere should facilitate and/or enhance the gratifications readers obtain from blogs. This thesis helps to understand the relationship between Audience Activity and the gratifications of blog reading. Accordingly, designers of such tools will benefit from this research with a clearer understanding of a) how the audience interacts with the weblog format, b) what are different behaviours of finding, keeping track of, and evaluating blogs, and c) how blog readers feel their experience can be improved.

Academics interested in media ecology, internet communication and culture, or a similar area of study will benefit from a greater understanding of how readers interact with blogs. Moreover, this research can be applied to other internet media formats. Transformations in communication technologies are so frequent in this age that it is important to look reflectively at how and why they are evolving, and at their role in affecting internet society and culture.[3]

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[3] For example, Dr. S Cody observes that graphical representation often takes over from language, linearity, and sequence imperatives that characterize traditional modalities of communication.

1.6 Outline

To begin to answer these three research questions, I discuss the weblog format, readers of weblogs, and tools that interface with the blogosphere. I use a theoretical framework that draws upon Uses and Gratifications Theory (U&G), Adaptive Structuration Theory (AST), and the theory of Task-Technology Fit (TTF). U&G helps to understand why users read weblogs and how they interact with and through them. TTF helps to understand how tools that interface with weblogs can be useful to readers, and suggests ways to identify and measure synergies between weblogs, users and tools. AST is a useful framework for describing the socio-technical system of bloggers, weblogs and the blogosphere. Moreover, its perspective is helpful in harnessing the untapped potential of readers.

In order to understand the interactive affordances of weblogs to the weblog audience, I begin by reviewing the evolution of the format and the basic anatomy of blogs. Drawing on AST, I discuss the social structures that arise from bloggers' use of the format, including communities, conversations, and some rhetorical functions of links. I then discuss typologies and frameworks for classifying weblogs and conclude the section with a typology of the interactive affordances of the weblog format.

With this context established, I turn to a discussion of weblog readers. I review readers' motivations for reading weblogs and the predictors and outcomes associated with these motivations, including opinion acceptance, word-of-mouth intentions, and interaction intentions. I discuss three typologies of social media users and relate them to the interactive affordances of the weblog format mentioned above.

I then review the prevalent tools that exist for interfacing with the blogosphere. In particular, I examine tools that support the basic tasks of finding and keeping track of blogs, such as blog-specific search engines and RSS feed aggregators. I discuss and conjecture about behaviours associated with using tools for these tasks, including browsing and searching for blogs to read, remembering blogs and subscribing to their RSS feeds, and following conversations among

blogs. I conclude this section by reviewing researchers' recommendations and designs for new tools that supplement weblogs.

Building on this background information, I construct a methodology to answer the research questions. I use interviews and an online survey, analyzing the survey data with factor analysis (PCA) and partial correlation analysis, and coding the interviews and the responses to an open-ended survey question. I present and discuss the results, and conclude by discussing the limitations of the study and making suggestions for future research.

2 Theoretical Framework

2.1 Information Systems: design science and behaviour science

This thesis is grounded in the Information Systems (IS) literature. Two paradigms characterize IS research: design science and behaviour science (Hevner, March, Park, & Ram, 2004). Design science research evaluates the utility, quality, and efficacy of IS tools. Behaviour science research seeks to "explain or predict… human phenomena surrounding the analysis [and] design… of information systems." Together, design science and behaviour science can describe "the functional capabilities, information contents, and interfaces implemented within the information system" (Hevner et al.).

Theories within the IS paradigm are concerned with the *utility* of tools in the context of *organizations*. These theories need to be adapted to consider weblog use that is not situated in organizations, addressing hedonic as well as utilitarian use of weblogs. Hedonic use is about self-fulfillment rather than instrumental value. Hedonic IS "are strongly connected to home and leisure activities, focus on the fun-aspect of using information systems, and encourage prolonged rather than productive use" (Van der Heijden, 2004). Outside of an organizational context there are no clear goals or performance metrics with which to evaluate blog use and the use of tools for interfacing with the blogosphere. Possible metrics need to be investigated, but cannot be solely relied upon for a thorough analysis of blog readers.

A conceptual framework to describe weblogs, tools, and users must enable discussion of the interaction between users and technology. The framework for this thesis is constructed out of three theories: Uses and Gratifications (U&G), Task-Technology Fit (TTF) and related concepts, and Adaptive Structuration Theory (AST).

U&G helps to understand why users read weblogs and how they interact with and through them. TTF helps to a) develop 'task models' for blog readers, b) understand how tools that interface with weblogs can be useful to readers, and c) suggest ways to identify and measure any synergies between weblogs, users and tools. AST is a useful framework for describing the

socio-technical system of bloggers, weblogs and the blogosphere. Analysis of the 'structural features' and 'spirit' of weblogs provides a valuable context for the application of U&G and TTF.

2.2 Uses and Gratifications (U&G)

Uses and Gratifications Theory asks why people choose one medium over another. It attempts to answer this question by looking at how they use the medium and what gratifications they seek and obtain from it. U&G posits an active, goal-oriented user who is aware of the influences the medium exerts on her, and who is in control of which media she uses and how she uses them. The user makes her choices based on her knowledge of the available media and functional alternatives to media consumption, and on her motivations and needs[4].

Users have expectations of media and choose media that fit their expectations. U&G distinguishes between gratifications sought (GS) and gratifications obtained (GO). This distinction is important for exploring the "latent structure of media gratifications" (Ruggiero, 2000), or *how* users use a medium, and how their use of it enables them to obtain the gratifications they seek.

As such, the concept of the active user is central to U&G. Pre-internet U&G research treated audience activity as a *mediating* variable[56] between GS and GO, concentrating on "choice, reception, and manner of response of the media audience" (Ruggiero, 2000). As a mediating variable, audience activity would be the generative mechanism by which GS influences GO.

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[4] U&G has been criticized for lacking an empirical distinction between needs and motivations. Moreover, U&G researchers attach different meanings to concepts such as needs, motives, uses, gratifications, social and psychological backgrounds, behaviour, and consequences (Ruggiero, 2000).

[5] In the sense made clear by Baron and Kenny, who "differentiate between two often-confused functions of third variables: (a) the moderator function of third variables, which partitions a focal independent variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable, and (b) the mediator function of a third variable, which represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest" (Baron & Kenny, 1986).

[6] To get the word 'mediating', I am paraphrasing a passage from (Johnson & Kaye, 2003)., which reads "Audience activity has been viewed by scholars as an intervening factor in the uses and gratifications process with gratifications sought influencing the level of audience activity which, in turn, influences the amount of gratifications obtained."

In the internet environment, audience activity [instrumental use] is more than just a scale (metric) variable, as media permit different kinds of actions and interactions. 'Interactivity' does not have a specific, agreed-upon meaning in U&G. For computers, interactivity can be dichotomized into human-computer interaction (HCI) and computer-mediated-communication (CMC). Broadly, interactivity suggests the degree of responsiveness of the medium to user commands. It may include, for example, the potential to monitor the medium, and the potential to add information for a mass-audience (Ruggiero, 2000). In weblogs, these translate to subscribing to RSS feeds and posting comments.

As an environment for media formats, the internet confronts U&G researchers with new concepts which relate to audience activity, including demassification, hypertextuality, asynchronicity, and multimediality (Ruggiero, 2000). **Demassification** refers to "the control of the individual over the medium" through the ability to "select from a wide menu" and to "tailor messages to their needs" (e.g. templated blogging software, and the absence of publishers with editorial control). **Hypertextuality** refers to the fact that hyperlinks allow a non-linear reading of text and web pages, with multiple possible paths through blog space (e.g. browsing through topical communities and following distributed conversations). **Asynchronicity** refers to the fact that "messages may be staggered in time" and to the "ability of the individual to send, receive, save, or retrieve messages at her or his convenience". **Multimediality** refers to the variety of older media that are contained in the Internet (e.g., text, graphics, video), which may be invoked, mashed up, and juxtaposed with relative ease.

Any definition of interactivity must be articulated with reference to the medium or format in question. Because types and amounts of activity depend on the affordances of the communication medium (as well as the individual), media may be analyzed on the basis of the interactivity that they provide to users (Ruggiero, 2000). For example, Kaye and Medoff suggest that "asynchronous modes of electronic communication, such as bulletin boards and electronic mailing lists, where users access and reply to messages at any time, may gratify different needs than synchronous modes of communication, such as chat rooms, where users "converse" in real time" (Kaye & Medoff, 2001).

The U&G approach suggests identifying the interactive possibilities for readers of weblogs and then looking at the activities of different readers and the gratifications these readers obtain. For example, it is reasonable to expect that the action of posting comments mediates between seeking and obtaining the 'Expression and Affiliation' gratification of reading blogs. Task-Technology Fit and Adaptive Structuration Theory help to better understand the task of identifying the interactive affordances of weblogs and how the audience makes use of them.

2.3 Theories of Fit

The concept of Fit has various instantiations in the evaluation of information systems, predominantly Task—Technology Fit (TTF) and Cognitive Fit (CF), but also the more qualitative Needs—Technology Fit (NTF).

2.3.1 Task—Technology Fit (TTF)

Task-technology fit is a perspective which "views technology as a means by which a goal-directed individual performs tasks." (Goodhue, 1995). That is to say, users use tools to complete the tasks necessary to achieve their goal. TTF reflects the principle that, for best performance, the functionality of the technology should fit the requirements of the task.

A technology's *functionality* is the set of functions that it can perform, which may enable the user to complete a task. Functionality includes the hardware, software, and design features of the system and supporting services (Goodhue & Thompson, 1995). Functionality is another way of thinking about the interactive affordances of a medium or tool. We will see that functionality can be described in the same terms as AST's structural features.

In order to identify the relevant dimensions of Fit it is necessary to outline a model of the relevant tasks and list their requirements. For example, Dwyer et al identified a task model for users of social network sites a) self-presentation, b) relationship initiation, and c) management of ongoing relationships (Dwyer, Hiltz, & Widmeyer, 2008). From Schmidt's framework for analyzing blogging practices we can infer a task model for bloggers: a) information management, b) identity management, and c) relationship management (Schmidt, 2007).

I suggest a basic task model for reading blogs: a) finding new blogs to read, b) keeping track of blogs to continue reading them, and c) interacting with bloggers and other readers. We can consider obtaining specific gratifications (i.e., transforming GS into GO) as the reader's goal, which these three tasks enable and frame. Weblog tools should support these tasks; moreover, new tools might enable new tasks, goals and gratifications for the prospective reader). As to the relevant dimensions of Fit, there are different ways to accomplish these three tasks, depending on the tools one uses (e.g., RSS feed aggregators vs. bookmarks). Depending on how and why readers use weblogs, they may have a preference.

2.3.2 Cognitive—Fit (CF)

For context, we can further break down the finding task, as it is important for designers of weblog tools. One of its requirements is the representation of information. Cognitive Fit asserts that, for best performance, the representation of information should fit both the tasks that the user will perform and the user's mental representation of the tasks. For example, Vessey and Galletta found that 2D graphs are suited for ascertaining spatial (relational) information, whereas tables are suited for looking up symbolic information (Vessey & Galletta, 1991).

CF can be used to judge various information visualizations (IV) in relation to the type of information being presented and the tasks users will perform with that information. For example, Shneiderman proposed seven basic tasks that IV should support: "Overview, zoom, filter, details-on-demand, relate, history, and extract" (Shneiderman, 1996). Vessey and Galletta suggest that a 'mis-fit' would entail more mental translation steps, thus slowing decision-making and impairing performance.

Cognitive Fit is a valuable perspective with which to approach information overload. 'Information Overload' (IO) is both the preponderance of unwanted information and the difficulty in compiling valuable information from different sources. It can conceptually be the result of both 'under-fit' and 'over-fit': Under-fit through the absence or inadequacy of a filtering tool, and over-fit if a medium or a tool offers too much information. IO has two

possible manifestations in the blogosphere, both having to do with the amount of information the user is exposed to: the length of blog posts and the number of blog posts.

2.3.3 Needs—Technology Fit (NTF)

From TTF and CF, we have an idea of how to explore the fit between users' tasks and the functionality (TTF) and interface (CF) of a technology or a medium. Tasks can be recast as the achievement of a goal or the fulfillment of a need or motivation, and as the specific actions taken therein.

Ip and Wagner created a Needs—Technology Fit model (NTF), which emerged from their research on the social use of the Xanga blog portal (Ip & Wagner, 2008). Their research questions were:

- What are webloggers' behavior (usage) patterns?
- What are the motives of using specific weblogging technology?
- How does weblogging technology support these motives?

They analyzed the features of three blog portals, and then conducted interviews with blog users, asking questions about usage intensity[7], perception of group belonging and sharing[8], and technology features used[9]. Based on a qualitative analysis of the responses, they identified four user types, differentiated based on usage intensity. By examining the technology features popular in each grouping, they found that usage habits and technology choices are driven by users' individual or social needs. Therefore, their typology of users represents a range of fit, with heavy usage intensity indicating a strong fit between the functional affordances of the blog portal and the nature and extent of blog users' social motivations.

In Ip and Wagner's NTF model, fit is elucidated by utilization – i.e., the better the fit between the user's needs and the additional functionality provided by the blogging portal (and the

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[7] Frequency and duration of use

[8] Interest in weblog as a sharing device, peer influence in usage behavior, feeling of group belonging

[9] Community building, journal writing, content management, security & privacy

medium itself), the more the user will use the technology. This measure of fit is affirmed by juxtaposing users' expressed needs and the nature of the additional functionality they used.
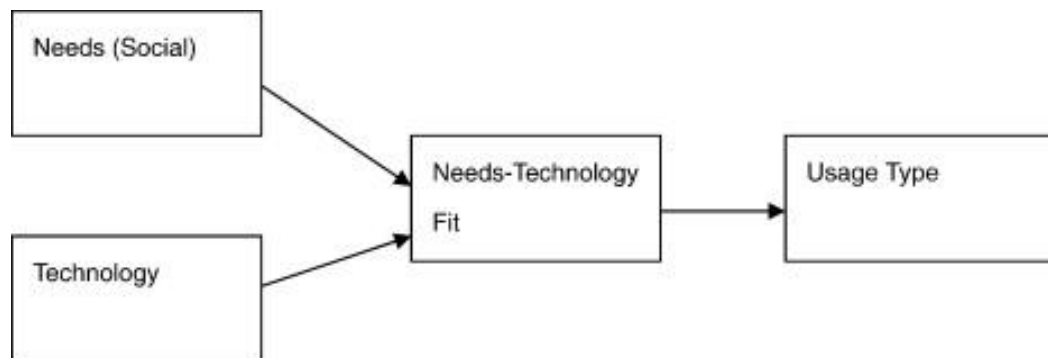
Figure 1: Needs-Technology Fit model (Ip & Wagner, 2008)

The Uses and Gratifications framework provides an opportunity to expand on the NTF model with a more thorough exploration of the needs and motivations that a technology or medium may gratify. Intuitively, a better Fit will lead to a better match between GS and GO. Therefore, it is prudent to investigate readers' motivations for using weblogs, as well as how and to what extent they interact with them. Ip and Wagner's NTF model suggests a way to differentiate between GS and GO: a high degree of "usage intensity" suggests that the user is obtaining gratifications from using blogs.

2.3.4 Measuring Fit

High TTF should result in a positive impact on performance, so measuring performance is one way of assessing TTF. In the absence of performance measures, TTF is a user-evaluation construct (Goodhue, 1995); it assumes that positive user-evaluations reflect the value of the technology in carrying out the tasks (Goodhue, 1998). "Task characteristics will 'moderate'[10] the strength of the link between specific characteristics of information systems and users' evaluations of those information systems" (Goodhue, 1995).

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[10] Recall Baron and Kenny's description of "the moderator function of third variables, which partitions a focal independent variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable, and (b) the mediator function of a third variable, which represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest." (Baron & Kenney, 1986).

Utilization has also been proposed as a means to evaluate TTF; however, "measures of use have problems as evaluations of systems because (1) use may not be voluntary, and (2) it may not be clear whether greater use is due to better or worse systems. (A "poor" system may require more use to accomplish the same task; a "good" system may encourage more use as more different tasks are tackled.)" (Goodhue, 1998). Measures of utilization include the frequency and duration of use, and the diversity (or possibly the number) of functionalities employed (Goodhue, 1995); hence Ip and Wagner's NTF framework.

It is reasonable to suggest that for Hedonic IS, high utilization is unlikely to be due to shortcomings of the technology. Rather, it would seem to indicate approval of the technology. The more motivations a medium gratifies, the better the fit, and the more time its user will spend engaged with it.

As users spend time engaged with a medium, their use of it evolves. Over time, users may influence the technology as well. While TTF is a static concept, AST offers a dynamic perspective.

2.4 Adaptive Structuration Theory (AST)

DeSanctis and Poole (1994) proposed Adaptive Structuration Theory as a framework for studying the organizational change that results from the introduction of new CMC technologies, such as group decision support systems (GDSS). However, for our purposes it will be abstracted from an organizational context. With what remains, AST is a framework for describing the evolution of a socio-technical system.

AST attempts to describe the **structure** of a technology, which consists of *structural features* and *spirit*; it then considers how groups **appropriate** (use) the structural features, enacting social structures in the process. AST holds that successful assimilation of technology occurs when a group's *appropriations* of the *structural features* are in line with the technology's *spirit* (DeSanctis & Poole 1994).

DeSanctis and Poole give two ways to conceptualize the **structural features** offered by a system: 1) as specific types of rules [e.g. voting procedures] and resources [e.g. stored data, public display screens]; and 2) as capabilities [i.e. functionality]. Structural features, including the technology's interface, suggest and influence behaviours surrounding use of the technology. The **spirit** of a CMC technology is the normative frame presented by its structural features and interface. DeSanctis and Poole suggest that a "coherent spirit" will "channel technology use in definite directions" (DeSanctis & Poole 1994). Spirit will reflect the designers' intentions to some degree, but it is necessarily a distinct concept, to be described objectively. Similarly, users cannot be presumed aware of the spirit of a technology they are using, and how it influences their use of the technology; they are unlikely to reflect on it unless prompted to do so. The perspective that technologies present normative frames which influence users is a valuable contrast to U&G's emphasis on an active, goal-oriented user who is aware of the effects of the medium on the content it presents.

While structural features and spirit enable, constrain, and influence social interaction, the group's use of the technology is also affected by pre-existing social structures. Sources of social structure include the organization[11] and its environment[12], and the group's tasks[13] and its social dynamic[14]. Note that social structures may be processes as well.

The structural features, spirit and social structures affect **appropriations** of the technology – which technology structures are used, and how they are used and interpreted. Appropriation analysis is accomplished by studying the group's discourse surrounding use of the technology. Social structures emerge out of consistent appropriations. **Structuration**, then, is "the process by which social structures (whatever their source) are produced and reproduced in social life"

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[11] E.g., reporting hierarchies, organizational knowledge, standard operating procedures (DeSanctis & Poole 1994).

[12] E.g., pressure to reduce spending, favouring a certain project, corporate information, histories of task accomplishments, cultural beliefs, modes of conduct. The structures of the organizational environment can be described in terms of complexity, formalization, and democratic atmosphere (DeSanctis & Poole 1994).

[13] E.g., the task content, and constraints such as the need to prioritize. Dimensions of task structures might be described in terms of complexity, richness, or conflict potential (DeSanctis & Poole 1994).

[14] E.g., styles of interacting, knowledge and experience with structures, perceptions of others' knowledge, agreement on appropriation (DeSanctis & Poole 1994).

(DeSanctis & Poole 1994). Some of the social structures surrounding blogs are (particular uses of) comments (§ 3.1.3.5), relationships embodied in links (§ 3.1.3.8), and blog conversations (§ 3.1.3.4), which may contain comments.

AST facilitates discussion of the blogosphere that bloggers shape and readers interact with. Bloggers are, of course, the principal actors appropriating weblog technology. They have established and continue to enact social structures, which readers must navigate without having participated in their creation. Schmidt applied sociological structuration theory to create "a general model to analyze and compare different uses of the blog format." Schmidt suggests that a blogger continually enacts social structures by (re)producing aspects of the guiding rules, (re)establishing social relations, and stabilizing or changing the way software-code is designed and employed (Schmidt, 2007). These three interdependent structural elements (rules, relations and code) frame "blogging episodes", in which bloggers are concerned with managing their information, identity and relationships embodied in their blog(s) (i.e., adhering to the task model discussed earlier) (Schmidt).

Table 1 presents the dimensions of structural features and spirit that DeSanctis and Poole identified for a GDSS, and the source material which they drew on for their analysis.

Table 1: Example structural features and spirit of a GDSS

Examples of structural features of a GDSS:	Examples of spirit of a GDSS:
• Level of restrictiveness (of the set of possible actions the user can take). • Level of sophistication (e.g. GDSS that provide communications support, and/or decision modeling, and/or rule-writing capability). • Comprehensiveness (richness – the number and variety of features offered to users).	• Decision process (e.g. consensus, empirical, rational, political, or individualistic) • Leadership (e.g. dominance vs. democracy) • Efficiency (e.g. how long are the interaction periods?) • Conflict management (e.g. will interactions be orderly or chaotic, lead to shifts in viewpoints, emphasize conflict awareness and resolution?) • Atmosphere (e.g. relative formality of the interaction; whether it is structured or unstructured)
Structural features of a GDSS can be identified based on analysis of:	**Spirit can be identified based on analysis of:**
• user manuals • discussions with designers • observations of the system itself • reports from users • etc.	• the design metaphor underlying the system • the features it incorporates and how they are named and presented • the nature of the user interface • training materials and online guidance facilities • other training or help provided with the system

With the benefit of the AST perspective, we can consider how the structural features of the weblog influence the reader's perceptions of blogs and his use of their features. For example, the reverse-chronological presentation of blog posts is suited to reading only the most recent posts; tags are suited, somewhat, to getting a sense of how the blogger thinks about her subject matter; and the blogroll is perhaps ill-suited to browsing because it does not display very much information about the blogs it links to. I now examine the structural features and spirit of the weblog format and social structures in the blogosphere. I begin by looking at the evolution of the blog format.

2.5 Connecting U&G, Fit, and AST

This thesis combines these three theories to study a sociotechnical system that is more complicated than each theory alone can confront. This system consists of different types of users and different interacting technologies: bloggers and readers, and blogs and a plethora of tools. This is obviously an ambitious undertaking, and it might seem to preclude obtaining any meaningful results from these theories. However, I contend that more can be gained from combining quantitative and qualitative methods to provide context for designers attempting to influence this sociotechnical system.

These theories contain similar concepts. In U&G, audience activity is the means by which users obtain the gratifications they seek. In AST, appropriation reflects the influences of structural features, social structures, and spirit on how the user uses the technology (i.e. on audience activity). Audience activity is dependent upon the available structural features or functionality of the weblog, so these concepts are used to investigate it.

First, this thesis builds a typology of the structural features of the weblog format. Because structural features influence appropriation (and audience activity), this typology also suggests a typology of audience activity. Along the way, this thesis looks at the outcomes of these audience activities (understandable as social structures) so that future research can grapple with structuration.

These concepts have to be considered both in relation to the weblog format and in relation to tools for interfacing with blogs. The thesis then looks at users, making the simplification of unifying GS and GO into motivations. This simplification has the added benefit of being able to make use of previous research concerning motivations for reading blogs. It then reviews correlations between motivations and audience activity that can be gleaned from the literature. Motivations influence audience activity in analogy with structural features influencing appropriation.

The thesis then looks at tools for interfacing with blogs, identifying them in terms of the task requirements of finding, keeping track of, and interacting with blogs. Cognitive fit helps to distinguish tools based on how they address these tasks, so that users can be compared in terms of their tool use, and the effects of different tools (e.g., RSS feed aggregators vs. bookmarks) on users, and their interactions with blogs can be looked at in more detail. Depending on how and why readers use weblogs, they may have a preference.

3 Background

3.1 The weblog format

3.1.1 The evolution of the weblog medium and the blogosphere

Weblogs began as hand-coded web pages. The term "weblog" was first used in 1997 by Jorn Barger, as ''a Web page where a Web logger 'logs' all the other Web pages she finds interesting" (Blood, 2004; Du & Wagner, 2006). As both a researcher and an early blogger, Blood characterizes her early blogging practices as concise writing, frequent interlinking with other blogs, and linking to obscure material, "combed and filtered for our readers" (Blood). This practice serves as a valuable filtering resource for the audience; it means they do not have to put in the effort to find that content for themselves, and that they see content they otherwise would not.

In 1999, Pyra Labs released the popular Blogger software for blog creation, making self-publishing possible without the need to know HTML. Pyra Labs' slogan was "**push-button publishing** for the people". Bloggers entered text into a single box. The simplicity of this interface made Pyra Labs the dominant blogging software company. Its simplicity ushered in an era of link-less blogs – the "blog-style weblog" (Blood, 2004). These blogs were more like diaries, enshrining the blogger's personal voice (Herring et al., 2005b). Websites like *LiveJournal* emerged as blogging portals, providing a backbone for social networks of diary blogs.

Blog publication software evolved to include a way to reference individual blog posts. In early 2000, Blogger introduced **permalinks** - permanent URLs for each individual blog post. Permalinks meant that it was no longer necessary to browse through archives to find the post that a blogger was referencing. They quickly became a required feature for blog-to-blog communication.

Bloggers began posting comments that they received from readers through email; **commenting** features became commonplace in blogging software (Scheidt, 2009). In 2001, *blogger* was the only platform without this functionality. The ability for readers to comment (publicly or

privately) on blog entries meant that the blog could be a participatory medium, because readers were given a voice (Blood, 2004).

Complementing permalinks, Six Apart's Movable Type blogging software introduced **trackback** in 2002 as a way to alert a blogger that her post had been referenced[15]. Trackback is an automated system that tells a blog when it has been linked to by posting a link to the referring blog on the referenced post (Marlow, 2005). A blog using trackback can display summaries of all the links to it, and the context of those links. Whereas bloggers previously combed through other blogs for references to their own, trackback enables conversations to span several blogs, and enables the formation of networks of individuals with similar interests (Blood, 2004). Trackback is a simple mechanism that arguably facilitated the explosive growth of the blogosphere.

Ease of publication and then conversation allowed topical blog communities to emerge. In late 2001, the blogosphere was becoming much more interconnected as a whole, and small communities were becoming increasingly structured (Kumar, Novak, Raghavan, & Tomkins, 2005). These blog communities exhibited 'bursty' link creation: periods of rapid interlinking, signifying periods of discussion (Kumar et al.; McGlohon, Leskovec, Faloutsos, Hurst, & Glance, 2007).

3.1.2 The structural features of Weblogs

Most blogs are created from templates provided by blogging software (Schmidt, 2007). The presentation of a weblog generally consists of a header, a sidebar on the right, and blog posts (Scheidt & Wright, 2004). At the top of the webpage, the header may contain the weblog's title, a quotation, and/or a graphic. In the sidebar, the blogger may choose to display some personal information, such as a brief biography, an email address, a self-representative image, and/or a list of present interests, etc.

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[15] www.sixapart.com/pronet/docs/trackback_spec

The sidebar typically has a **blogroll** (a list of links to other blogs) and an **archive** of past posts, typically presented in an expandable tree structure, organized by year, month, then date and title. The sidebar may have a list of **tags** – labels – which the blogger has applied to posts, and which work as links to all the posts bearing the tag. There may also be a search field for searching for content within the blog. Most blogs give the reader the option to subscribe to the blog via an RSS/atom feed. Feed aggregators are an important tool that will be discussed later.

The most recent blog posts are situated within the context of the header and the sidebar, displayed in reverse chronological order and stamped with the time and the date of posting. Blog posts may contain links to other blogs (i.e. **permalinks** to specific blog posts), websites, or other external media; they may also contain **internal links** to previous blog posts on the selfsame blog.

Many blogs allow readers to leave **comments**—sometimes anonymously, sometimes linked to an identity created through registration, perhaps leaving a trackback link to their own blogs. Some bloggers interact with their audience by posting polls in blog posts or through a sidebar polling add-on. They may give the audience the option to rate the post, and to easily 'share' the post – effectively promoting the blog – by linking to the post from social network sites, social bookmarking sites, or similar websites.

3.1.3 Spirit and Social structure in weblogs and in the blogosphere

Recall from Adaptive Structuration Theory that the 'spirit' of a CMC technology is the normative frame presented by its structural features and interface. It influences the use of structural features and the social structures surrounding them. The options (structural features) available in blogging software act as norms suggesting social structures. The ability to easily include a space and functionality for commenting suggests that interaction with the audience is a norm of blogging. The option to build a blogroll suggests that connecting to other blogs is normal, and that displaying a list of these connections is normal as well (Lenhart, 2005). Most blogs are created from templates provided by blogging software (Schmidt, 2007). From a small sample of random blogs, Scheidt and Wright observed that the design of blogs generally follows these

templates. When bloggers do make customizations, they tend to be in the sidebar. Bloggers tend not to change their blogs much over time (Scheidt & Wright, 2004).

DeSanctis and Poole suggest that a "coherent spirit" will "channel technology use in definite directions" (DeSanctis & Poole, 2004). Du and Wagner found that a blog's popularity bears a relation to what features of the blogging software are used to create it. The most popular blogs are written with software that promotes between-blog connectivity and audience participation (Du & Wagner, 2006).

3.1.3.1 Tags

The ability to apply tags to posts suggests that it is normal to categorize one's thoughts. Tags appear on the sidebar, serving a navigational function whereby anyone can click on a tag and be transported to a space containing all the entries to which that tag has been appended. In theory, a blogger's tags will form a coherent system. These tags offer a window into what the blogger thinks is essential about her posts, thus contributing to the reader's impression of the blogger (Lenhart, 2005). To use tags to navigate a blog, the reader has to become familiar with what the blogger is focused on and the associations he makes.

3.1.3.2 Blogrolls

Lenhart's ethnographic investigation of bloggers found that they attached various social significances to the blogroll. A blogroll might indicate interests (most often other blogs), social ties, approval directed through the link, or references related to the blogger's writing (Lenhart, 2005). Blogroll links might be construed as the blogger's recommendation and/or a personal reading list. Links to celebrity blogs or well-known blogs may be indirect expressions of personal opinions or attitudes.

Bloggers often feel obligated to include friends in their blogroll (Lenhart, 2005). Marlow observed that blogrolls represent "social acknowledgement" of the other bloggers listed, and that they serve "navigational" functions to assist readers in finding similar blogs, or others that may be of interest (Marlow, 2005).

The utility of the blogroll influences its semantics: the author of the linked-to blog can see that readers are coming to him from the linking blog. In Lenhart's study, one blogger viewed her blogroll as "a promotional tool, driving traffic to the websites and blogs she has selected and also as a tool for readers to discover other related blogs" (Lenhart, 2005).

Blogroll links are often reciprocal, and bloggers who reciprocate may have hundreds of blogroll links. Lenhart found that these bloggers assumed that readers would understand from the length of the blogroll that the blogger is not "making any guarantees or representations about the blogs on the list." Some bloggers make distinctions within their blogrolls through headings; others appropriate their RSS feeds to stand in for a blogroll, implying that they regularly read those blogs (Lenhart, 2005).

There is not much opportunity for bloggers and blog readers to come to the same understanding of the significations of the blogger's blogroll (Lenhart, 2005). Blog readers' impressions and interpretations of blogrolls are influenced by their impressions of the blog, their past experiences of blogrolls, and their impressions of the linked-to blogs.

3.1.3.3 Blog Communities

Blogrolls are part of the glue that helps to define blog communities, which rarely "have a shared space, clear boundaries, or clear membership" (Efimova, Hendrick, & Anjewierden, 2005). Blog communities tend to emerge around shared interests. They are constructed through interactions among bloggers, "who share routines and expectations about the use of blogs as a tool for information, identity and relationship management" (Schmidt, 2007). Some blog communities "have explicit norms laid out in written documents to which their members may or may not adhere. But for the most part, structural and emergent norms are the most operative in the blogosphere" (Lenhart, 2005).

Efimova suggests an algorithmic approach to identify communities, involving several cyber-artefacts which can help to approximate their boundaries, including: weblog reading patterns, linking patterns, and weblog conversations (Efimova et al., 2005).

3.1.3.4 Blog conversations

Blog conversations are distributed across several participating blogs, comprising blog posts, comments, trackback links and permalinks. They take a network structure as opposed to the hierarchical tree structure of conversations in computer conferences, forums, and mailing lists. It is often difficult or impossible to "get a sense of completeness in an argument/topic" (Andreasen, 2006), despite a "(relatively) high frequency of summaries" in weblog conversations (de Moor, & Efimova, 2004)}. Moreover, Efimova and de Moor observed interplays between conversation with self and conversations with others (Efimova & de Moor 2005), which would obfuscate inter-blog conversation.

In studying the Kuwaiti blogosphere, Hasan and Adamic conjectured the existence of two distinct social roles: "conversation starters, those who create high-level content, and conversation supporters, those who contribute to it and keep the conversation going." The importance of conversation starters is obvious; conversation supporters are the de facto response of the community, indicating various reactions, and the importance of the topic to the community, with the level of their participation (Ali-Hasan, & Adamic, 2007).

3.1.3.5 Commenting

Hasan and Adamic also observed that bloggers' interaction through comments is more direct and often more continuous than if they were responding to each other through posts on their personal blogs. This suggests that "the interactions that bloggers have with one another through comments may be more indicative of the depth of their relationship than other blog ties" (Ali-Hasan, & Adamic, 2007). Indeed, Mishne and Glance found that "chat sessions" often emerge from commenting behavior in personal journal blogs; and the number of comments a blog receives is often a good indicator of its popularity (Mishne, & Glance, 2006). However, if a post is particularly personal, responses are often emailed to the blogger, rather than made as public comments (Lenhart, 2005).

For readers, norms are easier to apprehend in commenting than in blogrolls (Lenhart, 2005). However, some readers, emboldened by the remoteness of hypertext communication, may disregard or even flout social norms by using incendiary language or trolling[16]. Lenhart suggests that "without explicit norms and the method or will to enforce them… blogs lose some of their potency as fora for open dialogue." (Lenhart, 2005). Some blogging software eliminates anonymous commenting. The enforcement of registration and some measure of identity goes a long way toward eliminating undesirable commenting behaviour, and forces commenters to be in some sense part of a community.

3.1.3.6 Community Blogs

Community blogs are collective creations wherein the line between bloggers and readers is blurred. Readers may register, comment, post links to their personal blogs, and even moderate. Silva et al investigated the community blog Metafilter. They found that cohesion in community blogs resulted from "(a) explicit ground rules regarding membership, (b) presence of moderators, (c) availability of profile information, (d) 'net etiquette', (e) tacit warrants for discerning pertinent posts, and (f) the deployment of specific techniques of discipline" (Silva, Goel, & Mousavidin, 2008). In the language of AST, the elements that bring about cohesion can be thought of as appropriation support and/or social structures.

Community blogs "share features with asynchronous discussion forums… in that both are multi- (Herring et al., 2005b). Community blogs tend to be recommender systems; Metafilter is a canonical example. Failblog (www.failblog.org) is a humour-oriented community blog, which posts captioned humorous images submitted by readers), which are rated by some of the community of readers.

3.1.3.7 A-list blogs

The most popular blogs in the blogosphere are referred to as 'A-list' blogs. These blogs are the most widely read, the most cited by the mainstream media, and the most linked-to by other

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[16] 'Trolling' is the act of taking on a persona with the intention of eliciting (over)reactions.

blogs. They tend to be filter-type blogs (providing links to material of interest to their readers), and are often politically oriented (Herring et al., 2005b). In contrast to blogs within communities, A-list blogs have been characterized as hubs in the blogosphere, and exhibit power laws for both in-coming and out-going links. The power law (or Pareto) distribution tends to arise from positive feedback loops; in this case, the fact that a website has many in-bound links increases the likelihood that others will also link to it. In-bound links give visibility, and in a sense they also give (the impression of) credibility. Especially in light of the influence of search engine algorithms, one might conclude that the monolithic 'A-list' blogs are a consequence of the structuration that occurs as bloggers read one another's work and interact.

3.1.3.8 The semantics of links and the hypertextual depths of the blog

Hyperlinks are simultaneously 'structural features' and 'social structures'. Hyperlinks have different utility depending on *where* they are used and *how* the blogger uses them (in their capacity as metaphorical linkages). Efimova suggests that "different interpretations of the social meaning of [links in the blogosphere] may create different dynamics of interactions between bloggers" (Efimova, & de Moor, 2005). Schmidt supports this perspective in his model analyzing blogging practices (Schmidt, 2007).

Scholars using Social Network Analysis (SNA) techniques to analyze weblogs tend to view the blogroll as representing some sort of affiliation, whereas the use of a permalink to reference another blogger's post suggests interest or attention (Marlow, 2005). A graph of blogroll links then reveals relationships and communities, whereas a graph of permalinks and trackbacks reveals conversation. Assumptions about the meaning of different kinds of links influence the conclusions drawn when studying the blog graphs constructed from them. In-bound links are often interpreted as a mark of influence and credibility (Gill, 2004), whether by ranking algorithms or by browsing humans.

A Blogger's use of links plays a significant role in the creation of her identity, influencing the reader's understanding of the blogger and her blog. The practice of linking is important for drawing and maintaining readership, and readers come to have expectations about the

blogger's use of links (Jarrett, 2003). Linking to past posts can be a useful tool for reflection, and allows for multidimensional arguments, conversations, and juxtapositions. It enables the blogger to construct a consistent yet evolving persona (Jarrett).

Through an analysis of academic weblogs, Luzón (2008) identified several rhetorical functions of links in academic weblogs, which can be summarized as:

- Self-publicity/credibility
- Creation of the blogger's identity
- Organization/content management
- Filtering information
- Community formation
- Facilitating blog-mediated conversation
- Interaction (e.g. RSS, email)
- Adding value to the blog
- Referencing and citing
- advertising

Some studies examine the prevalence of different types of links in parts of the blogosphere. Trammell et al. studied the linking practices of the Polish blogosphere, and found that Polish bloggers used hyperlinks in posts less frequently than English bloggers. More than half of the links provided background information on the topic being discussed (53.3%), and an even greater percentage referred to posts on other blogs (57.6%) (Trammell, Tarkowski, Hofmokl, & Sapp, 2006).

3.1.4 Frameworks for Classifying Weblogs

Along with this understanding of the structural features and social structures of weblogs, it is contextually useful to examine types of blogs, and frameworks for classifying weblogs generally. Types of weblogs can be thought of as appropriations of the format. In a sense, frameworks for classifying weblogs can be thought of as dimensions of appropriation.

Blood described early weblogs with three types:

- Diaries or personal journals, which can be participatory or (comparatively) private.

- Filters, in which the blogger directs readers to (external) content that he has effectively aggregated.

- Notebooks, which may contain either external or personal content, about which the blogger writes at some length (Blood, 2000, 2004).

Krishnamurthy categorized weblogs with the 2D plane shown in figure 2, comprising dimensions of authorship and content. The authorship dimension ranges from individual to community, and the content dimension ranges from topical to personal (Krishnamurthy, 2002).
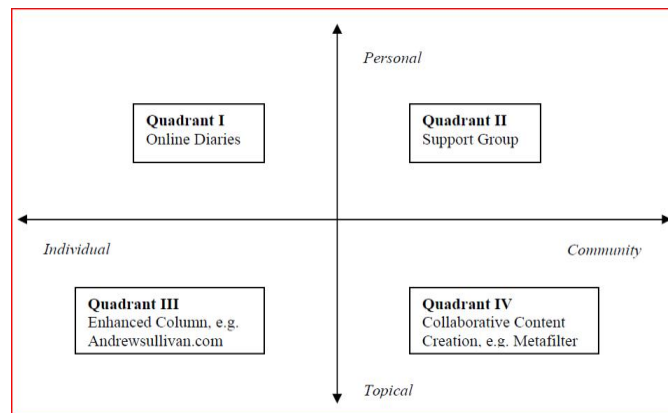
Figure 2: categorization of weblogs in dimensions of authorship and content (Krishnamurthy, 2002)

Hartelius described a similar categorization, but neglected the authorship dimension. He dichotomized "personal blogs" as either "supplementary" (extending the blogger's identity) or "individualizing" (revealing details of the blogger's life) (Hartelius, 2005).

Wijnia described weblogs as a communication channel within the Internet (Wijnia, 2004). This conceptualization suggests comparison of weblogs with other channels (e.g. instant messaging, email, forums) by highlighting their commonalities and differences in the context of the internet. Interrogating the possible uses of weblogs with Habermas' three world perspectives, Wijnia arrived at: presenting knowledge, self-expression, self-reflection, and social cohesion (Wijnia). These four uses roughly correspond to Krishnamurthy's dimensions: 'topical', 'personal', 'individual', and 'community', respectively.

Herring conceptualized weblogs as having fleshed out a continuity of internet genres (figure 3) from standard HTML "documents" (web pages) to
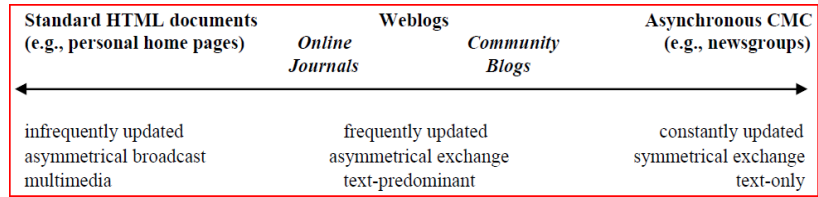
Figure 3: the weblog in a continuity of internet genres (Herring et al., 2005b)

asynchronous computer mediated communication (CMC); with this continuum she contrasted update frequency, mode of communication, and multimediality (Herring et al., 2005b). She suggested an additional dimension to compare weblogs: topical focus vs. topical heterogeneity.

Nowson and Oberlander have attempted to categorize weblogs based on the personality of the blogger, which they derived from the blogger's stylistic use of language (Nowson, & Oberlander, 2007). One could look at bloggers' use of hyperlinks through a similar lens; for example, using the rhetorical functions of links identified by Luzón, thus expanding on the blanket assumption that links indicate credibility.

Lomborg conceptualizes the weblog as a genre "determined by communicative functionalities and social uses" (Lomborg, 2009). Genre is "knowledge which users must have to be able to interpret and act in accordance with a given communicative context" (Lomborg); thus, appreciating genre is analogous to appreciating interactional norms, 'structural features' and 'social structures'. Lomborg proposes a framework to "conceptualize and draw distinctions between specific weblogs and sub-genres and to position them in relation to each other." His framework consists of three dimensions: Directionality, Content, and Style.

The Directionality dimension ranges from "monological" to "dialogical"; it has to do with the degree of interaction with the audience (or absence thereof) and with conversations and interconnectedness with other blogs. The Content dimension ranges from "internal" (i.e. personal) to "topical" (i.e. external). Some examples of blogs located along this dimension are diaries, notebooks (e.g. travel blogs), hobby, opinion, and research/corporate/journalistic blogs. The Style dimension ranges from "intimate" to "objective", i.e.

confessional/emotional/introspective, humorous/ironic, argumentative/factual/expert
(Lomborg, 2009).

3.1.5 A typology of audience activity for weblogs

Now, with reference to the structural features of blogs (§ 3.1.2), I construct a typology of Audience Activity for the weblog format.[17] Here I am suggesting a conceptual bridge between the perspectives of Uses and Gratifications and Adaptive Structuration Theory.

I propose three types of structural features in weblogs: **navigational**, **contributive**, and **promotional** (see table 2). Blog readers may be thought of as goal-directed users, purposefully using particular structural features[18]. The typology of Audience Activity can thus be used to understand how readers can contribute to structuration in the blogosphere (§ 3.1.3).

Readers' use of navigational structural features enables the generic behaviour of consuming content. Content in the blogosphere includes blog conversations, which are inter-blog social structures enacted by bloggers. A similar, in fact entangled example of social structure is conversation that occurs between the blogger and readers in the commenting spaces of blogs. (Bloggers who are commenting on another's blog are readers in this situation). In this example of a social structure, readers are taking part in the structuration process by using contributive structural features.

'Navigational' structural features allow readers to get to know the blog and the surrounding area in the blogosphere. They help readers to access past posts, to follow conversations, and to

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[17] For the purpose of addressing the three research questions, I separate the 'Interaction' task from the tasks of finding and keeping track of blogs, because I am examining Audience Activity solely with respect to the affordances of the format. The tasks of finding and keeping track of blogs are tied in with – in addition to the blog format – tools for interfacing with blogs and the blogosphere (§ 3.3).

[18] In addition to using structural features (implicitly) to obtain the gratifications they seek, readers may also use tools for finding and keeping track of blogs to accomplish tasks which suffice to bring about their goals. In this case, task-technology fit can help to understand if and how these tools are appropriate or inappropriate for readers.

check references. The rhetorical functions of links that Luzón identified (§ 3.1.3.8) provide context for using links to navigate.

'Contributive' structural features allow readers to add content by participating in polls and leaving comments on blog posts. Readers can add links in comments, and they can offer evaluations of blog posts through comments and by rating posts. Authoring a blog and making posts to community blogs can be thought of as contributive behaviour as well, although this typology is only concerned with the activity of the audience.

'Promotional' structural features allow readers to share the blog with their friends, narrowly or widely. Promotional behaviour includes emailing, IMing, and posting links to blog posts on Social Network Sites. In 'promoting', readers are essentially drawing attention and traffic to the blog post[19].

For completeness, it is necessary to define a consumptive type of interaction, wherein users are consuming and processing content. Lurking is the most basic consumptive behaviour, followed by reading comments and following conversations between blogs. Consumptive interaction is generally a prerequisite for all the behaviours above; similarly, navigational structural features are used to support consumptive behaviour.

The affordances of certain types of links – trackback links in particular – enable conversation between blogs. Readers may follow conversations between blog posts of separate blogs and in the comments on posts, by using navigational structural features. If the blogger adds external links to citations and references, readers may 'consume' those too. Readers can also read Advertisements and follow their links. They can use blogrolls to browse the 'local' blogosphere.

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[19] As far as I know, the links created by promotional behaviour are not used in any (ranking) algorithms for displaying content.

Table 2: A typology of structural features and audience activity for the weblog format

Type of structural feature and corresponding audience activity	Relevant structural features

Navigational	• Internal:
	    ○ Searching
	    ○ Archives
	    ○ Tags
	• External (following links):
	    ○ Blogroll
	    ○ Trackbacks
	    ○ Links from posts
	    ○ Advertisements

Contributive	• Authoring a blog (Blogging) • Making posts to community blogs • Leaving a trackback link

	• Posting comments:
	    ○ to the blogger
	    ○ to other commenters

	• Participating in polls • Rating blog posts

Promotional	• Sharing en masse, via:
	    ○ Facebook
	    ○ Digg
	    ○ Reddit
	    ○ Etc.
	• Sharing with individuals, via:
	    ○ Email
	    ○ Instant Messaging (IMing)
	    ○ Etc.

Consumptive behaviors	• Lurking • Reading comments • Following conversations between blogs

I cannot claim that this typology is comprehensive; however, it comprises the predominant modes of interacting with blogs. While there is a kind of hierarchy inherent in the presentation

of this typology, it is important to emphasize that it is not definitively hierarchical. Different types of activity have different uses, motivations, and effects. In order to facilitate, encourage, inhibit or harness audience activity, it is logical to inquire after the different motivations for or barriers to each type of audience activity, and about the effects or outcomes of the activities.

To answer RQ1, it remains to be investigated how readers' actual use of the weblog format relates to this typology. Therefore, I review the literature on blog readers concerning their motivations for reading weblogs and how audience activity has been found to relate to these motivations.

3.2 Blog Users

3.2.1 Demographics of weblog readers

Kaye found that, around 2004, blog readers tended to be young, highly educated males with high incomes. They exhibited "moderate to high levels of trust in government, high self-efficacy and high interest in political and general news" (Kaye, 2005). These blog users averaged 9.1 hours weekly on blogs. Graf's survey of political blog-reading California voters confirms these findings. Of their survey respondents, 9% visited political blogs almost daily (Graf, 2006).

Blogads, a company, which provides advertising for weblogs, conducted two surveys of the blog reading population in 2004 and 2005. In 2004[20] they had 17,159 responses from links posted by 40-50 of the biggest bloggers, many of whom focus on politics and/or sell blogads. The 2005[21] Blogads survey had 56,000 responses, of which 36,000 came from 'political blogs'. The survey was posted on 214 blogs.

The Blogads surveys appear to offer the most recent demographic information about blog readers. Blogads is a business, so these findings have not been subjected to peer-review; however, they noted that the surveys "heavily over-sample the most active readers of political blogs." Their sample is also heavily biased toward males.

These surveys give information about 'Usage Intensity': how many blogs respondents read daily and how many hours they spent reading blogs weekly. The surveys also investigated seven motivations for reading blogs to see how widely they were held. For ease of comparison, I have converted the scales used in the BlogAds survey into the five point scales used in the survey conducted for this thesis (see table 3 below).

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[20] http://www.blogads.com/survey/blog_reader_survey.html

[21] http://www.blogads.com/survey/2005_blog_reader_survey.html

	2004	2005
# of responses	17,159	30,079
Gender	79% M	75% M
Age	61% over 30	75% over 30
family income	40% make more than $90,000	43% make more than $90,000
are themselves bloggers	21%	21%
NEVER read blogs by RSS feed		72.4%
How many blogs do you read daily?		
0	0	0
1 to 2	10.0%	15.8%
3 to 5	35.1%	37.0%
6 to 10	30.2%	25.8%
>10	24.6%	21.4%
In an average week, roughly how many hours do you spend reading blogs?		
0-1	0.7%	0.6%
2 to 4	15.8%	23.8%
5 to 8	25.6%	25.6%
9 to 14	30.9%	26.9%
>14	24.6%	18.0%
"I read blogs for" (in order of prevalence)…		
News I can't find elsewhere	79.7%	75.3%
Better perspective	77.9%	74.6%
Faster news	65.9%	59.8%
More honesty	61.4%	60.6%
Transparent biases	50.3%	43.8%
More personality	47.0%	46.7%
Latest trends	35.0%	35.2%

Respondents of the BlogAds surveys tended to read three to five blogs daily, and averaged roughly ten hours reading blogs weekly. They appeared to most value the unique content and the perspective that blogs offer in a timely fashion. They also value authenticity on the part of the blogger.

3.2.2 Motivations for reading weblogs

In academic research, motivations for reading blogs have been explored through interviews (Baumer et al., 2008), surveys (Chung & Kim, 2008; Huang et al., 2008; Kaye, 2005), and surveys with open-ended questions (Karlsson, 2006; Kaye, 2006).

Baumer et al conducted qualitative interviews with 15 blog users with a median age of 22 who read at least 5 different blogs at least 2-3 times per week. Their responses emphasized information, inspiration, entertainment, and habit as primary reasons for reading blogs (Baumer et al., 2008).

Kaye conducted two studies on motivations for reading blogs, both based on an online survey. The first study (Kaye, 2005) analyzed responses to 28 statements about motivations for blog-reading derived from past U&G studies. These questions seem to be heavily loaded towards politics and comparison of blogs and traditional media. A factor analysis yielded six categories of motivations for reading blogs, which Kaye labelled 'Information seeking and media check', 'convenience', 'personal fulfillment', 'political surveillance', 'social surveillance', and 'expression and affiliation'. The factor labels are largely self-explanatory. Personal fulfillment has to do with entertainment and relaxation, but also includes aspects of social involvement. Social surveillance is about accessing a variety of viewpoints, including those of "the other side". See appendix 1 for a breakdown of Kaye's factors.

Kaye's accompanying study (Kaye, 2006) asked respondents to list three reasons why they read blogs. Coding reduced the responses to 62 motivational items, from which ten categories of motivations for blog reading were identified. Compared with the results of the above factor analysis (Kaye, 2005), the coders found slight shifts in the compositions of the categories, as well as four new ones: 'Anti-Traditional Media Sentiment', 'Fact Checking', 'Intellectual and Aesthetic Fulfillment', and 'Blog Presentation/Characteristics'.

'Convenience' expanded from 'quick, easy and readily available' to include the filtering mechanism that some blogs/bloggers provide. 'Personal Fulfillment' lost its 'social involvement'

aspects, thus becoming somewhat synonymous with 'Entertainment'. 'Expression and Affiliation' grew to include items like 'communicating with friends, sense of community, and the draw of the blogger's personality'. 'Information Seeking' lost its 'media-check' aspect and became focused on the variety and specificity of the information available including social trends and current events, and the uses to which the reader might put the information. 'Political Surveillance' remained essentially unchanged, while 'Social Surveillance' transformed into 'Guidance/Opinion Seeking', adding 'looking for support for one's opinions'.

Anti-Traditional Media Sentiment' broke away from the 'Information Seeking and Media Check' factor (Kaye, 2005). This separation suggests that blogs hold a lot of informational value beyond politics and the mainstream media. 'Intellectual and Aesthetic Fulfillment' is comprised of appreciation for bloggers' writing, debates, arguments, and expert opinion and knowledge. The items that comprise 'Blog Presentation/Characteristics' represent both the weblog format and how the blogger makes use of it. 'Blog Presentation/Characteristics' is the largest category with ten subcategories.

Common themes from Kaye's two studies include: reading blogs for Expression and Affiliation, Information, Entertainment née "personal fulfillment", and Convenience. Among the other findings were political surveillance, anti-traditional media sentiment and fact-checking. 'Blog Presentation/Characteristics' is the most diverse motivational label. It emphasizes aspects of the weblog format, the blogger's personality and how the blogger uses the format in the construction of her blog.

Huang et al surveyed 204 students in Taiwan, and found that they were motivated to read blogs by **"affective exchange, information search, entertainment, and getting on the bandwagon"** (Huang et al., 2008). 'Affective Exchange' roughly equates with 'Expression and Affiliation', although the focus is on friendships, and suggests the extension of offline friendships to the online world. 'Information Search' combines 'Information Seeking' with aspects of 'Convenience' such as the ease of finding specific information of interest. 'Entertainment' is similar to 'Personal Fulfillment', comprising motivations such as fun, habit, and escaping

boredom. 'Getting on the Bandwagon' means reading popular blogs, often identified from lists, by the attention they receive.

Adding this third study into the story, the common themes appear to be Expression and Affiliation, Information, and Entertainment. Naturally, these three categories are too general to evoke the weblog format.

Chung and Kim surveyed the readers of diary/journal style blogs with the word "cancer" in their titles (Chung & Kim, 2008). These could be considered support group blogs according to Krishnamurthy's categorization (§ 3.1.4) but they are not necessarily community-authored. Chung and Kim focused on GO (gratifications obtained, § 2.2) by asking about the outcomes of blogging activities on respondents' lives rather than about "why they might participate in various blogging activities". They adapted 16 questions from the U&G literature, but declined to investigate gratifications such as entertainment and diversion, arguing that these were not appropriate to their sample population. They identified four factors representing GO: 'Emotion Management', 'Information-Sharing', 'Problem-Solving', and 'Prevention and Care'. 'Emotion Management' is similar to 'Expression and Affiliation' while 'Information-Sharing' includes the solidification of existing relationships. 'Problem-Solving' and 'Prevention and Care' both involved outcomes of reading cancer blogs, including changing life-styles and becoming more involved in treatment and with physicians.

Disregarding gratifications obtained, these findings do not reveal anything new. Future studies should investigate if and how audience activity drives gratifications obtained, with reference to the typology of Audience Activity developed earlier (§ 3.1.5) and the typology of Motivations for reading blogs being developed here. To capture the weblog format as an object of study, I am endeavouring to build a typology of Motivations that reflects aspects of the format. One of the most important aspects of the format is that it lowers or obsoletes traditional barriers to 'publishing' such as sponsorship and censorship. Therefore, we must ask what about blog authors themselves may be motivating readers to read blogs; for instance, how do they express themselves through the medium?

Karlsson surveyed the readers of four independent diary blogs through open-ended questions, and found the most-wanted and least-wanted characteristics of diary blogs (Karlsson, 2006). Her results suggest that readers of diary blogs seek entertainment and desire to relate to the blogger, but only want to see his best qualities. These should include personality, authenticity, humour and good writing. Diary blog readers also emphasized regular updating and photos.

The main motivational categories that these studies found include accessing blogs for expression and affiliation, information, entertainment, and convenience. Readers also use blogs for political surveillance, as well as for "Information I can't get from traditional media", because they are perceived to lack bias or acknowledge their bias. Many readers are motivated to read blogs for argument and debate, analysis and commentary, to check facts and for Fisking. The results of the motivation studies are summarized in table 4.

Table 4: Motivations for reading weblogs

(Baumer et al., 2008)	(Kaye, 2006)	(Huang et al., 2008)	(Karlsson, 2006)
• Information • Inspiration • Entertainment • habit	• blog presentation / characteristics • personal fulfillment • expression/affiliation with bloggers and blog users • information seeking • intellectual/aesthetic fulfillment • anti-traditional-media sentiment • guidance/opinion seeking • convenience • political surveillance • fact checking	• Affective exchange • Information search • Entertainment • Getting on the bandwagon	Wanted in a diary blog: • Humour • Authenticity • good writing • nice design • current topics • ability to identify • photos
(Kaye, 2005) • Information seeking and media check • convenience • personal fulfillment • political surveillance • social surveillance • expression and affiliation		(Chung & Kim, 2008) • Emotion Management • Information-Sharing • Problem-Solving • Prevention and Care	BlogAds 2004, 2005 • Faster news ~60% • Latest trends ~35% • Transparent biases ~48% • Better perspective ~76% • More personality ~47% • More honesty ~61% • News I can't find elsewhere ~78%

In none of these studies was a distinction made between blog readers and bloggers reading blogs. This lack of distinction is problematic because some of the motivations for reading blogs are related to motivations for authoring blogs, such as 'Expression and Affiliation'. We do not know to what extent these responses reflect blog users vs. blog readers.

This detailed look at the motivations of blog reading suggests that many of them are intertwined with each other and with the interactive affordances of the format; a users strongly motivated by 'Expression and Affiliation' would be likely to post comments. Some studies which looked at motivations for blog reading also looked at predictors and outcomes of those motivations.

3.2.3 Predictors and outcomes of motivations for reading weblogs

In studying users of cancer blogs, Chung and Kim investigated the power of demographic, attitudinal and interactive variables to predict gratifications obtained. Chung and Kim treated motivations for blog use as the dependent variable because their questions were phrased to capture gratifications obtained (in the form of outcomes of blogging activities on respondents' lives). Overall, the perceived credibility of blogs, posting comments on others' blogs, and hosting one's own blog significantly increased the explanatory power of their regression models. Demographic information about their sample, how much time respondents spent reading blogs, and their self-reported internet skill level offered no predictive value for the gratifications obtained from reading blogs.

In studying university students, Huang et al investigated the power of gratifications of blog reading to predict 'opinion acceptance', 'interaction intention' and 'word-of-mouth intention'. 'Opinion acceptance' "reflects the degree of belief in and approval of the messages on blogs"; 'interaction intentions' "is the tendency to interact with bloggers, measured by eight items such as *I would reply messages to the bloggers* and *I would like to participate activities held by bloggers*"; 'word-of-mouth intentions' "is the tendency to transmit messages on blogs to other people" through recommending blogs and forwarding articles (Huang et al., 2008).

Kaye constructed a regression model to predict each of six gratifications of blog reading from among the following independent variables: "trust in the government, self-efficacy, interest in news and current events, interest in politics, political involvement since becoming a weblog user, length of time accessing weblogs and the Internet, hours per week on weblogs, level of weblog participation, and demographics."

Chung and Kim found that 'posting comments' predicted 'information sharing' (Chung & Kim, 2008). Huang et al. found that 'interaction' predicted 'affective exchange' and 'getting on the bandwagon' (Huang et al., 2008); while Kaye found that 'weblog participation' strongly predicted 'Expression and Affiliation', moderately predicted 'Personal Fulfillment', and slightly predicted 'Information Seeking and Media Check', 'Convenience', and 'Social Surveillance' (Kaye, 2005).

Chung and Kim found that 'perceived credibility' predicted obtaining three gratifications: 'prevention and care', 'problem solving', and 'information sharing' (Chung & Kim, 2008). Huang et al found that 'opinion acceptance' predicted 'affective exchange', 'information search', and 'entertainment' (Huang et al., 2008).

Huang et al found that 'WOM (word-of-mouth) intention' predicted 'affective exchange' and 'getting on the bandwagon' (Huang et al., 2008).

Kaye also found that 'hours per week spent on weblogs' predicted all the gratifications that she found: 'information seeking and media check', 'convenience', 'personal fulfillment', 'political surveillance', 'social surveillance', and 'expression and affiliation' (Kaye, 2005). The details of each regression analysis are presented in Appendix 1.

Having a general perspective on why readers read blogs and how they can interact with blogs, we can now investigate what kinds of tools exist to support their interaction.

3.3 Tools that interface with the weblog

The TTF theory tells us that tools should offer functionality that helps readers perform the tasks necessary to achieve their goal in reading blogs, which is to obtain the gratifications they seek. Therefore, tools should both facilitate and accentuate the gratifications obtained from blogs. Some basic tasks are necessary to facilitate gratifications, including: a) navigating the blogosphere and finding new weblogs to read, b) keeping track of blogs to continue reading, and c) interacting with blogs, bloggers, and other readers. I discuss these three tasks along with specific examples of tools available for interfacing with blogs.

This is a high-level, incomplete list of tasks for blog readers. More specific ways of interacting with blogs, or with a corpus of blogs, are worthy of future consideration. Some tools which support tasks that do not fall into the above task model such as blogpulse and blogscope, which both allow users to obtain interesting meta-information about overall trends in the blogosphere, are discussed below.

3.3.1 Navigating the blogosphere

Movement within the internet consists of traversing a graph, wherein the edges are hyperlinks, and the nodes are web pages (or anything with a URL). The user chooses his path based upon the information contained in the present node that concerns the links leaving that node. The content of each node is displayed by the user's web browser, which provides some basic navigational functions. It enables *multimediality* – containing a variety of media; it enables retracing one's 'steps' through hyperlinks, backwards and forwards. Browsers offer bookmarks, histories, and 'wonder bar' text recall for the user to keep track of sites she has visited. This is all worth mentioning because web browsers are so pervasive that their use has become virtually unconscious; I suggest that for many internet users, web browsers are synonymous with "the web."

We can make a distinction between two navigating behaviours: **searching** and **browsing**. Whereas searching is a goal-directed behaviour that makes use of tools like search engines, browsing is less goal-directed and more spontaneous.

3.3.1.1 Browsing

One browses through lists of links (e.g. blogrolls) or blogs listed by category in a blog directory. When browsing, one makes use of the information or signage that is available about the next possible links to follow. Various architectures to guide browsing include archives, taxonomies, folksonomies, and blogging websites.

Blogging websites, or blog portals, can function as social gathering places (e.g. www.livejournal.com) or as marketplaces where bloggers can set up shop and make money through hosting advertisements (e.g. www.b5media.com). Livejournal allows more functional relationships between blogs; for example, a 'friend' is a specific relationship that grants each party access to the other's journal entries. The blogging portals that offer additional functionality can be thought of as tools that facilitate a community. Baumer found that readers used blogging websites (sometimes exclusively), and links from their own blogs (as would likely be the case in community blogging portals like Livejournal) to find and read blogs (Baumer et al., 2008).

3.3.1.2 Searching

Users can search for content in the blogosphere with blog-specific search engines like Technorati. The user targets the search with key words, and the search engine applies an algorithm to generate a list of results. The results are generally ordered by some measure of 'authority', which often includes the number, nature and source of in-bound links to the blog. Search queries can be refined, narrowed and expanded. In comparison to web search engines, blog search engine results "are sensitive to the choice of search engine, the parameters used and the date of the search" (Thelwall & Hasler, 2007). Aside from searching for blog posts, some tools allow users to search for meta-information, like a measure of overall mood, and can

"track the spread of ideas across the blogosphere (e.g. www.blogdex.net and www.blogpulse.com and www.daypop.com)" (Herring et al,. 2005a).

Technorati is probably the best-known blog search engine. Search queries can be formulated with Boolean logic operators, and results can be restricted to posts, whole blogs, images, videos, a specific language, entries with a specific tag, or posts that link to a specific URL. Technorati also returns meta-information about weblogs, including information about the author and a measure of the weblog's influence or 'authority' (Gill, 2004), and a list of blogs/posts that have linked to the weblog. "One of Technorati's principal services is to allow users to search for "conversations," or linked discussions, on specific topics" (Herring et al., 2005a). Technorati also "organizes blog posts into topic categories and allows readers to browse popular posts by their recency" (Hearst et al., 2008). Technorati also facilitates browsing behaviour through the extraneous information returned by search queries and through lists of the "hottest blogosphere items", etc. Thus, Technorati can be used for both searching and browsing.

This thesis uses the distinction between browsing and searching behaviours, as well as knowledge of different 'types' of links (§ 3.1.3.8), to examine the underlying structure of users' blog seeking habits. To better outline the context in which these findings apply, I now discuss searching scope, interfaces and functionalities.

3.3.1.3 Scope

Baumer et al discuss a 'social scope', which has to do with searching or browsing one's local network according to some measure of social authority. "Social browsing is analogous to social search: where social search means seeking out information by consulting one's local social network, social browsing refers to scanning through references collected by a set of trusted individuals" (Baumer & Fisher, 2008).

Efimova identifies different scopes of searches based on the target area. One might wish to search for content within an individual blog, or search across groups of blogs, or all blogs. One

might wish to track hyperlinks between blogs, and identify clusters of weblogs based on their hyperlink connections and/or the similarity of their content (Efimova, & de Moor, 2005).

3.3.1.4 Interfaces

We can expand on the idea of a searching function by considering the presentation of the results, and what meta-information is returned by a search. The theory of Cognitive Fit suggests that the presentation of information influences the efficiency of different searching tasks for the user, and AST suggests that it influences searching behaviour.

Two different concepts of searching interfaces are clustering and fisheye views. Clustering is a technique of grouping similar results together. It allows an easy overview of search results, and brings the lower search results to the foreground. A fisheye view has a central focus and shows the 'surroundings' with decreasing levels of detail.

3.3.1.5 Some functionalities pertaining to navigation

We can go deeper and discuss subtasks of the searching task by considering seven high-level tasks in information visualization: "Overview, zoom, filter, details-on-demand, relate, history, and extract" (Shneiderman, 1996). In the extreme, we can imagine navigating blog space, with seamless transitions between the blogosphere and the space of an individual blog. The ideal tool for navigating blog-space might be something that blurs the distinction between a search engine and a web browser, and is specialized for the structural features and social structures of blog-space.

BlogScope (www.blogscope.net) is an analysis and visualization tool for the blogosphere. It tracks over 50.4 million blogs with 1300 million posts. Its functionality includes "spatio-temporal analysis of blogs, flexible navigation of the Blogosphere through information bursts, keyword correlations and burst synopsis, as well as enhanced ranking functions for improved query answer relevance" (Bansal & Koudas, 2007).

Blogpulse (www.blogpulse.com) is "an automated trend discovery system for blogs, which applies machine-learning and natural-language processing techniques". It "knows" over 126

million blogs. Its conversation tracking functionality "creates a threaded view of the conversation by performing a depth-first traversal of the conversation graph, starting from the seed post and visiting each node only once". Its trend search functionality creates graphs tracking key words, phrases or links over time. Its blogger profile functionality returns information about a blog: its activity, its subject matter, ranking, and so forth.

Issues to consider in the design of tools for navigating the blogosphere include, but are not limited to: the desired scope, the nature of the interface, and providing meta-information that aids in navigation. Such meta-information could, for example, include semantics to describe different links. This is context in which to place the goals and results of this work. Similarly, context about user behaviour surrounding the use of searching tools is warranted.

3.3.1.4 Search queries, user behaviour, and recommendations for search

In 2005, users of the blog search engine www.blogdigger.com were using functionality like "local-based search, media search (i.e., filtering to find multimedia files or links), and the ability to subscribe to the results of a search query (Mishne & de Rijke, 2006). Mishne and de Rijke offer a typology of search queries: "tracking references to named entities" (52%), "general topics" (26%), and "navigational, adult and miscellaneous queries" (24%). Most of the "named entity" queries were aimed at current discourse; the more general queries were concerned with the topic of discourse over its currency. The search queries displayed particular interest in current events, technology, entertainment and politics relative to WWW searches. As with searching the web, users' searching sessions were short, and they focused on the first few results (Mishne & de Rijke).

Hearst et al identify three kinds of blog search tasks that should be enabled or enhanced (Hearst et al., 2008):

- "A search for information that was published in blogs sometime in the past."

- "A search for opinions or feelings about a subject. This type of search should also provide information about the author of the post, and identify the commenters and bloggers who have referenced the post in their own blogs."

- "A search for "good" blogs/authors to read. To support a search for appealing blogs, an interface should facilitate the creation of feeds – on subtopics, across several blogs simultaneously. Biographical information about the author should be provided, as well as information on the characteristics of the blogs."

The above context for understanding users' behaviour regarding finding weblogs includes a) the kinds of interfaces, search functionalities and meta-information results that are available; b) recommendations of blog search tasks that should be enabled; c) the functionality searchers use, a typology of search queries, and the interests of blog searchers relative to web searchers.

3.3.2 Keeping track of blogs

Users need a way to keep track of the blogs they read regularly and specific posts they want to be able to reference. Possibilities include relying on memory and search engines to retrace one's steps, relying on a web browser's history, bookmarks, or whatever else it may have, actively tagging blogs or posts, and subscribing to a blog's RSS feed.

I distinguish between **remembering** behaviour and **subscribing** behaviour in terms of tool use. 'Subscribing' means using an aggregator to read RSS feeds from blogs. Users can also subscribe to the results of search queries with tools like Google Alerts (www.google.com/alerts), so that new results are sent to them by email. Remembering is typified by using bookmarks and tags. It is supplemented by weblogs' archives. This thesis uses the remembering / subscribing distinction as a basis for formulating questions about how users keep track of blogs. Following, I give context to understand the effects of each type of behaviour (or type of technology) on the user.

3.3.2.1 Remembering

Bookmarks and tagging have the advantage of allowing the user to categorize the content she wishes to remember. Readers can also assign tags to blogs – and to other web pages – through social bookmarking tools like Furl and Delicious. Readers use these tools to share tags, giving rise to a 'folksonomy'. The term signifies that the usage of the tag is "determined by the practicing community, as opposed to being decreed by a committee" (Brooks & Montanez, 2006). Readers seem to use tags in three ways: to categorize, summarize, and to make content more easily retrievably. However, folksonomic tags are better suited to categorizing articles than to summarizing their content (Brooks & Montanez). Blog search engines like Technorati also use tags to index blogs.

3.3.2.2 Subscribing

RSS (really simple syndication) technology became widely used around 2000. Feed aggregators allow readers to subscribe to RSS feeds from blogs so that they are notified every time new content is posted. Aggregators download the content in a form much like email (Marlow, 2005). RSS feeds have synergy with the updatable nature of blogs. They make it easier for readers to stay current with a blog and read it routinely.

RSS feeds will make the reader more passive in his consumption of blogs. Instead of checking on disparate favourite blogs periodically, he can peruse his aggregated collection of all the blogs he finds interesting, and he is always up-to-date. He may save time deciding which posts to read by screening by title and/or summary. RSS aggregators may be desktop or web-based (e.g. www.bloglines.com, www.igoogle.com). Some blogs support a Twitter interface, such that the blogger tweets announcements of new posts among her other tweets.

However, reading a blog through an RSS aggregator changes the reader's experience of the blog. Aggregators remove the posts from the context of the blog's design and layout – e.g., its blogroll, images, and videos. Readers will not see the interactive and conversational elements of blogs, such as comments and trackbacks. Therefore, readers who read a blog exclusively

through an aggregator also miss out on the public interactions between an author and her readers (Lenhart, 2005).

3.3.3 Interacting within the blogosphere

Several researchers have made recommendations concerning functionality to facilitate interaction, and have discussed in what contexts and for what purposes some functionalities are important (see, for example, (Schuff et al., 2010) concerning deliberative discourse).

In 2004, Nardi's ethnographic investigation of conversations taking place within and between blogs with smaller audiences led her to conclude that the trackback functionality should be made easier to use, and that the ability to both limit and alert the audience of a post should be improved. She suggested that, to support conversation, tools should provide the functionality to identify and sort posts by contributor and topic, and better support for following the thread of a particular argument, as well as its references (Nardi, Schiano, & Gumbrecht, 2004). Schiano suggested that tools should provide improved privacy and audience specificity (Schiano, Nardi, Gumbrecht, & Swartz, 2004).

Many researchers have articulated a need to develop tools that enhance the self-awareness and situational awareness of the user. One reason for this is to encourage reflection, to "transform routinized blog reading into a more engaging, fulfilling experience" (Baumer et al., 2008). It might also help to allay fears about the credibility of blogs. After all, at least part of the onus for gauging credibility must belong to the reader.

Boyd asserted that, in general, tools and media, which support social interaction should provide situational, contextual information, allowing users to see the 'spatial extent' of their 'presence' and 'influence'. However, the information they present to the user should be limited to what is available to the system or persons with which the user is interacting. This means that a blogger's MySpace profile should not be (immediately) visible to a reader[22]. Ultimately, both raw data and higher-level impressions of the user should be presented. From an ethical

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[22] For example, Social Network Sites limit visibility to friends of friends.

standpoint, "systems should not require personal information to gain access, as this allows for discrimination."

Baumer observed disconnects between "the pressures felt by bloggers and the expectations of readers", which lead him to suggest that tools are needed "to allow more nuanced interaction" between them (Baumer et al., 2008). Unfortunately, it is too much of a digression to describe these disconnects. This thesis does not investigate tools to support interaction beyond finding and keeping track of blogs; however, open-ended questions may well elicit responses pertaining to tool-supported audience activity.

3.3.4 Academic tools that support finding, keeping track of and interacting with blogs

Many researchers have conceived and to some extent implemented new tools for interfacing with the blogosphere. Following, I discuss tools which enhance navigation of individual blogs through the archives (Indratmo & Gutwin, 2008), of blog communities through the blogroll (Baumer & Fisher, 2008), in blog portals (Campbell et al., 2005), for conversation discovery (Tauro et al., 2008; Tauro, 2008), and of blog graphs in general (Laqua, Ogbechie, & Sasse, 2007). Some researchers seek to augment other tools, for example by connecting the finding task with RSS feeds (Java et al., 2007); other researchers are interested in facilitating deliberative discourse (Schuff et al., 2010).

"iBlogVis" is a tool that provides an interactive visualization of a blog's archive (Indratmo & Gutwin, 2008). It displays the weblog posts along a timeline with the content above and a history of the social interaction below. Information is encoded in the visualization, including the lengths of posts and comments, number of comments on a post, and the popularity of tags (frequency of use). On a panel to the right of the visualization, lists of commenters and tags can be used to filter it. The comments and tags themselves can be sorted alphabetically and by frequency of use. From a user evaluation of iBlogVis, Indratmo and Gutwin found that the social interaction history was more useful for browsing than for searching. They also note that the visualization is best suited to blogs whose content does not lose value with age.

Baumer and Fisher created "Smarter Blogroll" to enhance blogrolls by providing topical summaries of the blogs they link to, so that users do not have to visit the blog to learn what it is about (Baumer & Fisher, 2008). For the blogger, this tool can enhance the blogroll as a means of keeping track of the blogs she reads, making her blog a more functional space to inhabit rather than just a means of self-presentation. Baumer and Fisher found that users preferred to see recent blog posts instead of topical summaries, making the blogroll similar to an RSS feed. Many such tools exist as plugins for the popular Wordpress blogging software[23].

Blogscape (Campbell et al., 2005) is a visualization tool for social networking in blog portals like Livejournal. It enables users to look for others based on their interests, geographical location, and the steps of virtual separation between them. It uses map, tabular, and matrix displays for an interface based on the principles of overview, zoom and filter, and details on-demand (Shneiderman, 1996). The map view represents other users on a geographical map of the United States with virtual separation encoded in colour "darkness". The tabular view shows all the search results, which are sortable by attribute. The matrix view is a "2D view of the user's immediate social network", wherein a measure of the similarity of interests is encoded as the size of a circle, and the physical separation is encoded in colour darkness.

Vizblog (Tauro et al., 2008) is a tool for conversation discovery. It presents the user with a graph with three types of links between blog posts, according to the similarity of their content and/or the presence of a citation link between them. Nodes are highlighted if they match a search string. Vizblog's interface reflects the principles of overview, zoom and filter, and details on-demand (Shneiderman, 1996); for instance, users can filter by similarity coefficient and they can go directly to a blog post by clicking on a node.

Laqua et al. discuss contextual user interfaces that aim to provide improved orientation on a blog graph, enabling more explorative interaction strategies. The StarTree Interface uses a dynamic navigation tree; with a click or mouse-over, the user can display a linked-to article in the content panel on the left. The Focus-Metaphor Interface could be interpreted as a fish-eye

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[23] They can be found among other plugins related to blogrolls: http://wordpress.org/extend/plugins/tags/blogroll

view mapped onto a StarTree-like structure. The selected article is at the centre of the star with contextual interface elements arranged around it, enabling navigation. They provide previews of content similar to a search engine results page. Selecting a context element moves it into the centre, and the display of contextual elements is adapted accordingly. Laqua et al. found that their participants preferred both contextual interfaces to the regular weblog interface (Laqua et al., 2007).

Java et al. created "Feeds that Matter" (FTM! – ftm.umbc.edu/), a recommender system based on Bloglines RSS feed aggregators, which helps users "browse and subscribe to an automatically generated catalogue of popular feeds for different topics." Bloglines also allows users to organize their feeds into folders by applying labels. The set of all users' folder labels and the feeds they contain can be treated like a browsable folksonomy, and feeds can be ranked based on how many users follow them (Java et al., 2007). However, the algorithm still needs work, as the effects of a blogger's popularity outweigh those of the topical relevance of the blog post.

In FeedWiz, textual clustering replaces hyperlinks as a metric of association. This change removes the visibility that arises through link-related structuration, which reflects bias induced by like-minded blogs linking to each other. Schuff et al. also intend to design a participation facility to facilitate "pluralistic decision-making at many levels ranging from small organizations to society at large" (Schuff et al., 2010).

Schuff et al. seek to expose blog readers to a greater amount of information without overloading them. They propose four design artefacts – "a communal repository, textual clustering, visual cues, and a participation facility for blog users" – to aggregate and organize content, and thereby reduce information overload. Visual cues reduce cognitive work by offloading it to visual perception, thus reducing information overload. One can frame the effectiveness of specific uses of visual cues in terms of cognitive fit. Their prototype – FeedWiz – represents the number of blog post in a topical cluster visually as the area of a circle. While the user does not perceive an exact number, a sense of its magnitude is conveyed which is easily comparable with the cardinality of other clusters.

4 Methodology

This study employs both quantitative and qualitative methods to answer the three research questions. It collects data from nine hour-long interviews and an internet survey consisting of several five point Likert scale questions and one open-ended question.

The first research question – "How do readers interact with blogs? What are the motivations for and impediments to their interaction?" – is investigated with 17 survey questions based on the typology and behaviours of audience activity (§ 3.1.5), and 20 questions based on the discussion of the motivations for reading blogs (§ 3.2.2). The analysis of Motivations for reading blogs is largely confirmatory in that the questions were created based on Kaye's investigations (Kaye, 2005, 2006). The underlying structure of blog readers' Motivations and Audience Activity are investigated with factor analysis; partial correlation analysis is used to relate them. The interviews provide a qualitative dimension to the discussion of the results.

The second research question – "What behaviours do readers report and exhibit in finding and keeping track of blogs?" – is addressed by survey questions about respondents' use of the tools available for *browsing* (§ 3.3.1.1) and *searching* (§ 3.3.1.2) the blogosphere, and for *Remembering* (§ 3.3.2.1) and *subscribing* to (§ 3.3.2.2) individual blogs. These task technology behaviours are examined with factor analysis and fleshed out with context from the interviews.

The third research question – "How can the current technologies/tools for finding and keeping track of blogs be improved upon?" – is investigated through the open-ended survey question – "Please suggest some ways in which your blog experience could be improved" – and survey questions about respondents' Usage Intensity. The survey asks about hours per week spent reading blogs, the number of blogs read regularly and how frequently they look at blogs. As well, it addresses the degree of Information Overload they experience, in terms of feeling overwhelmed or annoyed with the *length* and/or the *number* of blog posts they wanted to read.

Responses to the open-ended questions are coded into categories and then grouped into subsets, ready to be discussed. Partial correlation analysis is used to test the relationships between the behaviours of Finding and Keeping track of blogs with Usage Intensity, Information Overload, Motivations and Audience Activity.

4.1 Survey design

The survey questions about Motivations, Audience Activity, Finding, Storing, Usage Intensity and Information Overload were posed as statements measured with a five-point Likert scale from "strongly disagree" to "strongly agree". It was important to keep the number of questions low in order to keep the survey at a manageable length to maximize the completion rate.

4.1.1 Motivations for reading blogs

Respondents' motivations for reading blogs are investigated with 20 statements completing the phrase "I read blogs…". The phrases were designed to: a) re-establish the motivations for blog reading found by previous research, and b) pay sufficient attention to motivations for blog reading that are tied to the spirit of the blog medium. The expectation with (b) was a yield of new and relevant correlations, leading to new knowledge.

The wording of the survey questions was chosen to reflect the weblog format. The main motivations were primarily represented with the 12 survey questions in table 5. The remaining eight questions were chosen to represent the role of the blogger in motivating readers and the less central themes of politics and the mainstream media (see table 6).

Table 5: Survey questions reflecting the main motivations of blog readers

Convenience	Expression and Affiliation	Information	Entertainment
Because they are updated frequently.	To communicate with friends who have blogs.	For information.	For entertainment.
Because I can access them anywhere/anytime.	To interact with others like myself.	To keep abreast of current trends.	
To save me time in looking for content.	To communicate with people in other parts of the world.	Because I can't find the content anywhere else.	
Because it's easy to find what I want.		For links to more sources.	

Table 6: Survey questions reflecting other motivations of blog readers

Blogger	Politics	Mainstream Media
For the blogger's personality.	To follow politics.	As an alternative to the mainstream media.
To read about the blogger's life.	To participate in political discussions.	Because the blogs I read are credible
For access to experts.		For other opinions /points of view.

These questions have not all been validated as measures of specific constructs. In fact, many could be placed in more than one category; "for links to more sources", "because I can't find the content anywhere else", "for other opinions/points of view", and "because they are updated frequently" all depend on to some extent on the 'Blogger'. Conversely, "for access to experts" is likely correlated with 'Information', and "to read about the blogger's life" is likely correlated with 'Expression and Affiliation'. 'Politics' and 'Mainstream Media' are most likely

correlated as well. More questions should have been chosen to investigate the entertainment motivation.

Five of these questions also imply some level of Audience Activity: "to communicate with friends who have blogs", "to interact with others like myself", "to communicate with people in other parts of the world", and "to participate in political discussions" all involve some contributive element, e.g., participation and/or communication. "For links to more sources" implies that readers follow such links, navigating.

4.1.2 Interacting with blogs

Respondents' interaction with blogs was investigated with 17 statements completing the phrase "When I read blogs, I mostly…". The statements were chosen to investigate the typology of Audience Activity (§ 3.1.5), reflecting navigational, contributive, promotional, and consumptive behaviours (see table 7). Of course, these behaviours are intertwined – at least some navigational and consumptive behaviour is necessary before the reader can contribute to or promote the blog.

Navigational	Contributive	Promotional	Consumptive
Look through the blog's archives	Write a comment to the blogger	Share a post (via FaceBook, Digg, Reddit, etc.)	Just read.
Search for content within the blog	Write a comment in response to another comment.	Share a post with specific people (via email, instant messaging, etc.)	Read comments
Follow a link from the blogroll	Leave a trackback link to my own blog		Follow conversations between two or more bloggers
Follow the bloggers' links from a blog post	Participate in polls		Further investigate and/or buy a product that a blogger has discussed/reviewed
Follow trackback links from comments to other blogs.	Rate the post I'm reading		Click on ads in blogs
Follow conversations between two or more bloggers			

4.1.3 Finding and keeping track of blogs

Seven ways of finding blogs and five ways of keeping track of blogs were explored. The questions about finding blogs were designed to draw a distinction between *searching* and *browsing* behaviours and to investigate use of tools for finding blogs, including blog-specific search engines and regular search engines (see table 8). The questions about keeping track of blogs were designed to investigate use of tools such as bookmarks and RSS feed aggregators and to draw a distinction between *remembering* and *subscribing* behaviours (see table 8). A single question was used to do this – "I find and/or keep track of blogs I want to read…" – with respondents marking their level of agreement or disagreement on a five point Likert scale with

phrases completing the statement. Because Technorati can be used in both searching and browsing capacities, it belongs in both categories.

Table 8: Survey questions about finding and keeping track of blogs

Searching	Browsing		Remembering	Subscribing
With a regular search engine (i.e. Google)	By browsing categories		By retracing my steps	With an RSS feed aggregator
By searching for similar content	Via links from a blog you're currently reading		With bookmarks	
By searching "what's popular?"	Via links from another website		With my web browser's history	
With a blog search engine (i.e. Technorati)			From memory	

4.1.4 Usage Intensity and Information Overload

Information about respondents' 'Usage Intensity' was gathered with three questions:

- in an average week, roughly how many hours do you spend reading blogs?" (0-1, 2-4, 5-8, 9-14, >14)
- "how many blogs do you read daily?" (0, 1-2, 3-5, 6-10, >10)
- "in an average week, roughly how often do you look at blogs?" (< once a week, ≥ once a week, A few times a week, ≥ once a day, > once a day).

The latter question, capturing frequency of consulting or connecting with the blogosphere, was not part of Ip and Wagner's conception of usage intensity. Hence this question expands the field of study. It may indicate habitual blog reading, possibly reflecting how frequently some blogs are updated. The use of tools for keeping track of blogs may influence this metric of usage intensity and it might correlate with Information Overload as well.

Information Overload was investigated in respect to the *length* and the *number* of blog posts that users wanted to read. The questions were phrased, "I sometimes get annoyed/overwhelmed by the *length* (*number*) of blog posts I want to read", and measured with the five point Likert scale from "strongly disagree" to "strongly agree".

4.1.5 Other questions

An open-ended question solicited responses about how users' blog reading experience might be improved: "Please suggest some ways in which your blog experience could be improved."

Finally, the following demographic information was solicited: gender, age, level of education, income, internet experience, and blog experience. See Appendix IV for the complete survey.

4.1.6 Procedure for coding answers to the open-ended survey question

Responses to the open-ended questions were manually categorized, based on likeness. In some cases, judgments were made to decide which category a response belonged to, or whether it bridged categories, or whether it should be excluded. Once the categories were established and confirmed, subsets were developed using the same process.

4.2 Recruitment for survey

This study employs a convenience sample composed of the researcher's acquaintances and blog readers who responded to postings on various blogs about the survey. The researcher solicited participation from his acquaintances through a variety of means:

- A Facebook message was sent to all the 'friends' (n = 227) within the researcher's social network. They were also asked to pass the survey on to their friends and relatives who read blogs.
- An email message was sent to the MBA portal of Ryerson University's email service.
- Close friends and relatives were contacted via email, and asked to pass the survey on to their acquaintances.
- One of the researcher's friends moderates the internet forum *Liberating Minds*. He posted an advertisement and link for the survey on that site.

- All requests were repeated after one week.

Although in the instances of direct acquaintances or friends, an informal request was typically used, as the distribution became more far-flung, an explanatory message was sent to contacts so that they could more easily and accurately forward the request (and do so in a way that was likely to garner response.) Recruitment messages are in Appendix II.

4.3 Interviews

The interviews were designed to be exploratory, to gain more contextual information about usage, behaviour patterns, and experience of blogs. Interview subjects were recruited based on an existing relationship or a referral, and convenience. The subjects were chosen to cover a wide range of 'Usage Intensity' and motivations. They were also known to be critical thinkers, able to identify and articulate experiences and patterns, which for others may reside on a more automatic level.

5 Analysis

5.1 Demographic profile of survey respondents

After collection, the survey data were loaded in Microsoft Excel and any response that was more than 10% incomplete was deleted. There were 19 respondents remaining who had 0 years of experience reading blogs, and 8 who did not answer the question. Respondents with 0 years of blog reading experience were removed. Five of those who did not list their experience were removed because their blog use was minimal. Of 481 responses, 352 remained.

Of these, 30% were bloggers, 13% had blogged in the past, 6% had plans to start a blog, and 51% were blog readers only. Roughly 33% used Twitter, 65% did not, and 2% did not respond to the question. Roughly 59% of respondents were male, 38% were female, and 2% did not answer the question. On average, respondents had been using blogs for the last 4.6 years, and the Internet for 9 years longer. Respondents to this survey were highly educated, with 79% holding at least an undergraduate degree. The distribution of education levels is shown in table 9, and the distribution of income ranges is shown in table 10.

Table 9: Education profile of survey respondents

Education (highest level)	%
Some high school	0.9
High school graduate	1.2
Some college/ university	18.6
College/ university graduate	22.6
Pursuing / obtained a graduate degree	56.8

Income	%
<$20,000	25.4
$20,000 - $39,999	14.7
$40,000 - $59,999	18.6
$60,000 - $79,999	17.4
$80,000 - $119,999	16.2
$120,000 - $300,000	6.9
>$300,000	0.9

5.2 RQ1: How do readers interact with blogs? What are the motivations for and impediments to their interaction?

The 20 survey questions about Motivations and the 17 questions about Audience Activity were analyzed with factor analysis to determine the underlying structure of users' blog reading gratifications. Factor analysis of the Motivations questions found five factors: 'Expression and Affiliation', 'Information', 'Convenience', 'Entertainment'/'Blogger Identity' and 'Political Discussion'. Factor analysis of the Audience Activity questions found three factors: 'Comment', 'Promote', and 'Following Conversation'.

5.2.1 Factor analysis explained

The responses to fixed questions—given on a 5 point Likert scale from "strongly disagree" to "strongly agree"—are analyzed with factor analysis. Factor analysis is an interdependence technique that is used to "define the underlying structure among the variables in the analysis" and/or as a data reduction method (Hair et al., 2010).

Factor analysis treats each respondent as a vector in an N-dimensional question space; since a 5 point Likert scale was used, each dimension has a range of five, though they are treated as continuous for the analysis. The factor analysis uses the correlations between questions to group them into 'factors' that 'explain' as much variance as possible. It is up to the researcher to name each factor based upon the statements which load onto it the most.

There are two approaches to obtain a value for each respondent representing each factor: factor scores and summated scales. Factor scores are linear combinations of the questions; they are chosen to have a mean of zero and a standard deviation of one. The factor scores are also designed to be orthogonal, meaning that there is no correlation between them. Summated scales are a simpler alternative to factor scores that are reproducible for future studies. Summated scales derive a score representing each factor for each respondent by averaging the variables which most loaded on to that factor in the analysis.

Factor analysis is completely dependent upon the questions asked. Because factor analysis always produces factors, there is risk of the "garbage-in, garbage-out" phenomenon. Hair observes that "the quality and meaning of the derived factors reflect the conceptual underpinnings of the variables included in the analysis" (Hair et al., 2010). If a few similar questions are asked along with several dissimilar ones, the results of the analysis may be biased towards the factors defined by the similar questions.

Further, "the researcher must also ensure that the sample is homogenous with respect to the underlying factor structure" (Hair et al., 2010). Therefore, it may be inappropriate to apply factor analysis to motivations for reading blogs to bloggers and blog readers, because they may differ.

5.2.2 Factor analysis of motivations for reading blogs

To confirm the motivations for reading blogs found by Kaye, and to investigate the role of bloggers in motivating people to read blogs, factor analysis was conducted on the 20 motivation questions. The factors were extracted with principal components analysis. The initial analysis found five factors with eigenvalues greater than 1, and the Scree plot confirmed the appropriateness of a 5-factor solution. However, m1, m3, m10, m14 and m20 had communalities of less than 0.50 with the other variables, meaning that less than half of their variance was explained by the factor solution (Hair et al., 2010). The factor analysis was repeated as these variables were removed one by one.

Factor loadings of ±0.5 or greater are considered statistically significant; this constraint, and the fact that it did not load conclusively onto any factor, dictated the removal of m2 (Hair et al., 2010).

The measure of sampling adequacy (MSA) quantifies the appropriateness of applying factor analysis; at .731, factor analysis is appropriate here. The final five factors explain 69.8% of the variance. The factors were extracted with principal component analysis, and a varimax rotation was applied. The choice of PCA entails that the factors will be orthogonal. Factor scores were computed with the Anderson-Rubin Method, which scales the scores to have a mean of 0 and a standard deviation of 1, and ensures orthogonality. Uncorrelated factor scores avoid any complications of multicollinearity in future analyses.

Table 11 shows the significant factor loadings, the derived factor labels, and the percentage of variance explained by each factor:

	Variable	Factor Loadings					Factor Label	Variance Explained (Total = 69.8%)
M8	To interact with others like myself.	.856					Expression and Affiliation	17.0%
M9	To communicate with people in other parts of the world.	.829						
M7	To communicate with friends who have blogs.	.810						
M13	Because the blogs I read are credible		.840				Information	16.8%
M12	For access to experts.		.789					
M16	For information.		.736					
M14	To keep abreast of current trends.		.653					
M6	Because it's easy to find what I want.			.843			Convenience	13.4%
M5	To save me time in looking for content.			.830				
M4	Because I can access them anywhere/anytime.			.693				
M15	For entertainment.				.784		Entertainment	11.5%
M19	For the blogger's personality.				.774			
M11	To read about the blogger's life.				.649			
M17	To follow politics.					.899	Political Discussion	11.0%
M18	To participate in political discussions.					.838		

The factors are named based on the variables which loaded onto them. This thesis asked questions that were similar but not identical to those asked by (Kaye, 2005) (see Appendix II). It is improper to expect that these factors will mirror those found by Kaye because the makeup of the factors is dependent upon the questions asked. However, it is not surprising that the factors which emerged from this analysis are quite similar to those that Kaye found. For instance, 'Expression and Affiliation' was named in accordance with Kaye's terminology (Kaye, 2005, 2006).

Expression and affiliation is most strongly represented by users' motivation to find and communicate with like-minded people. 'Information', 'Convenience', and 'Political Discussion' echo Kaye's factors as well. The motive of getting information from blogs is strongly linked to finding credibility in the blogosphere, and to reading bloggers who purport to be experts in some area. The major aspects of convenience for weblog readers are the ease of finding what they want and the time saved in looking for content. The findings of my analysis tied keeping up with politics together with participating in political discussions.

The 'Entertainment' factor is similar to Kaye's 'Personal Fulfillment' factor; both comprise entertainment, yet 'Personal Fulfillment' includes the desire to 'feel involved', whereas 'Entertainment' includes interests in the blogger's personality and life.

Summated scales were also constructed to represent the factors because scales are reproducible in future studies. Summated scales are formed by averaging the variables that load highly onto the same factor. Cronbach's alpha scores were calculated to measure the reliability of the scales; a value of no less than 0.6 (preferably 0.7) is desirable (Hair et al., 2010). In three cases, the scale was improved by the deletion of an item. When m4, "to keep abreast of current trends", was removed from the "Information" scale, the improvement was only .001; however, the deletion of m4 is warranted because Cronbach's alpha is positively influenced by the number of variables in the scale. The removal of 'entertainment' from the 'Entertainment' factor is a significant conceptual shift; that factor was renamed 'Blogger Identity'. The scales, alpha scores, and their significance are represented in table 12. The statistical significance of

results is principally conveyed in the p value, which denotes an upper bound on the probability of incorrectly rejecting the null hypothesis, i.e., obtaining a false positive (Type I error). Thus a lower p value denotes a more statistically significant result. Typically accepted p-values are .05 or .01, corresponding respectively to a 5% or 1% chance of rejecting the null hypothesis when it is true (Hair et al., 2010).

Table 12: Reliability analysis for motivations for reading weblogs

	Variable	Factor Label	alpha	p
M8 M9 M7	• To interact with others like myself. • To communicate with people in other parts of the world. • To communicate with friends who have blogs.	Expression and Affiliation	.825	.000
M13 M12 M16	• Because the blogs I read are credible. • For access to experts. • For information.	Information	.770	.000
M6 M5	• Because it's easy to find what I want. • To save me time in looking for content.	Convenience	.757	.009
M19 M11	• For the blogger's personality. • To read about the blogger's life.	Blogger Identity	.713	.000
M17 M18	• To follow politics. • To participate in political discussions.	Political Discussion	.786	.000

The conceptual shift that occurred from 'Entertainment' to 'Blogger Identity' suggests that the factor analysis be repeated with the 12-variable basis (see table 13). Using the same variables in the factor analysis and in the scales is necessary if we want to compare these two views of the data. The MSA for this factor analysis is 0.697. Like Cronbach's alpha, the MSA is positively influenced by the number of variables, so the drop from 0.731 is not a significant concern. The new solution explains 77.8% of the variance in the 12 variables.

Table 13: Secondary factor analysis of motivations for reading weblogs

	Variable	Factor Loadings					Factor Label	Variance Explained (Total = 77.8%)
M9	To communicate with people in other parts of the world.	.865					Expression and Affiliation	19.4%
M8	To interact with others like myself.	.856						
M7	To communicate with friends who have blogs.	.785						
M13	Because the blogs I read are credible		.860				Information	18.1%
M12	For access to experts.		.827					
M16	For information.		.758					
M17	To follow politics.			.894			Political Discussion	13.6%
M18	To participate in political discussions.			.859				
M6	Because it's easy to find what I want.				.885		Convenience	13.5%
M5	To save me time in looking for content.				.876			
M19	For the blogger's personality.					.865	Blogger Identity	13.2%
M11	To read about the blogger's life.					.828		

5.2.3 Interactions with blogs

Factor analyses of the questions about interacting with blogs suggested three factors: 'Comment', 'Promote', and 'Follow Conversation' (see table 14). The MSA was 0.742.

Table 14: factor analysis of interactions with weblogs

	Variable	Factor Loadings			Factor Label	Variance Explained (Total = 70.3%)
A14	Write a comment to the blogger	.876			Comment	26.4%
A15	Write a comment in response to another comment.	.872				
A13	Read Comments.	.648				
A8	Follow trackback links from comments to other blogs.		.820		Follow Conversation	23.5%
A9	Follow conversations between two or more bloggers.		.723			
A12	Search for content within the blog.		.663			
A3	Share a post (via facebook, digg, reddit, etc.)			.852	Promote	20.3%
A4	Share a post with specific people (via email, instant messaging, etc.)			.836		

After the factor analysis, summated scales were created, and the reliability analysis suggested the removal of A12 and A13. Reliability analysis of the scales with A12 and A13 removed is shown in table 15.

		Variable	Factor Label	alpha	p
A14 A15		• Write a comment to the blogger • Write a comment in response to another comment.	Comment	.925	.003
A4 A3		• Share a post with specific people (via email, IM, etc.) • Share a post (via facebook, digg, reddit, etc.)	Promote	.717	.000
A8 A9		• Follow trackback links from comments to other blogs. • Follow conversations between two or more bloggers	Follow Conversation	.671	.010

The factor analysis was repeated with the remaining six variable (see table 16)l; it had an MSA of 0.677. Only two factors had an eigenvalue greater than 1, but the Scree plot confirmed the three-factor solution.

Table 16: Secondary factor analysis of interactions with weblogs

	Variable	Factor Loadings			Factor Label	Variance Explained (Total = 82.4%)
A14	Write a comment to the blogger	.926			Comment	31.0%
A15	Write a comment in response to another comment.	.916				
A4	Share a post with specific people (via email, instant messaging, etc.)		.886		Promote	25.9%
A3	Share a post (via facebook, digg, reddit, etc.)		.819			
A8	Follow trackback links from comments to other blogs.			.865	Follow Conversation	25.5%
A9	Follow conversations between two or more bloggers			.822		

5.3 RQ2: What behaviours do readers report and exhibit in finding and keeping track of blogs?

Three factors of blog-finding behaviour and two factors of blog-storing behaviour were found: 'BSE Browsing', 'Link Browsing' and 'Searching'; 'Remembering' and 'Subscribing'.

5.3.1 Finding blogs

A factor analysis of the questions about finding blogs found two factors with an eigenvalue greater than one, but the Scree plot suggested a three-factor solution. Whereas the two-factor solution grouped F5 with F6 and F7, reliability analysis of the combined factor (F5+F6+F7) suggested excluding F5. Table 17 shows the factor analysis excluding F3. The MSA was .722.

The first factor was labelled 'BSE Browsing' to reflect readers' use of the blog search engine. Recall that Technorati supports both searching and browsing behaviours. Searching for "what's popular" echoes the 'Getting on the Bandwagon' motivation for blog reading found by (Huang et al., 2008), which was linked with 'Interaction' and 'WOM Intentions'.

'Link Browsing' (via links from a blog and links from a website) suggests an immersive experience of the blogosphere wherein users roam from blog to blog. Following links from another website (perhaps a blog portal) suggests that users know they are navigating into the blogosphere, and thus browsing it intentionally.

Finding blogs may often be an incidental outcome of using regular search engines like Google. For example, one of the interview subjects, KS, described searching for information on an academic author/topic and finding the author's blog in the process.

Table 17: factor analysis of finding behaviours

	Variable	Factor Loadings			Factor Label	Variance Explained (Total = 81%)
F2	By searching "what's popular?"	.881			BSE Browsing	36.3%
F1	With a blog search engine (i.e. Technorati)	.856				
F4	By browsing categories	.766				
F6	Via links from a blog you're currently reading		.918		Link Browsing	27.6%
F7	Via links from another website		.866			
F5	With a regular search engine (i.e. Google)			.948	Searching	17.1%

The reliability analysis of the summated scales is shown in table 18:

Table 18: reliability analysis of finding behaviours

	Variable	Factor Label	alpha	p
F2	• By searching "what's popular?"	BSE Browsing	.810	.000
F1	• With a blog search engine (i.e. Technorati)			
F4	• By browsing categories			
F6	• Via links from a blog you're currently reading	Link Browsing	.789	.002
F7	• Via links from another website			
F5	• With a regular search engine (i.e. Google)	Searching	n/a	n/a

5.3.2 Keeping track of blogs

The factor analysis of the questions about keeping track of blogs had an MSA of .699. It is shown in table 19.

	Variable	Factor Loadings		Factor Label	Variance Explained (Total = 64.3%)
R4	With my web browser's history	.816		Remembering	41.7%
R1	By retracing my steps	.750			
R2	With bookmarks	.680			
R5	From memory	.624	-.421		
R3	With an RSS feed aggregator		.940	Subscribing	22.5%

As expected, a clear distinction between 'Remembering' and 'Subscribing' behaviour for the 'keeping track of blogs' task is apparent.

'Remembering' might be a bit of a misnomer because the factor comprises memory as well as functionalities which aid memory.

It is worth noting that the three-factor solution isolates R2 – 'with bookmarks' – which might have been valuable to compare technologies; however, the reliability analysis (table 20) suggests that R2 be kept with R1, R4, and R5.

Table 20: Reliability analysis of storing behaviours

	Variable	Factor Label	alpha	p
R4	• With my web browser's history	Remembering	.698	.000
R1	• By retracing my steps			
R2	• With bookmarks			
R5	• From memory			
R3	• With an RSS feed aggregator	Subscribing	n/a	n/a

The results of the four factor analyses reduced the data to five motivations for reading blogs, three audience activities, three 'finding' and two 'storing' technology use variables, shown in table 21. With these results, we can now create a typology of weblog readers.

Table 21: Motivations for reading weblogs, weblog Audience Activity, and methods of Finding and Storing weblogs

Motivations	Actions
• Expression and Affiliation • Information • Politics • Convenience • Blogger Identity	• Comment • Promote • Follow Conversation
Finding	**Storing**
• Link Browsing • BSE Browsing • Searching	• Remembering • Subscribing

5.4 RQ3: How can the current technologies/tools for finding and keeping track of blogs be improved upon?

Respondents' 'Usage Intensity' and experience of 'Information Overload' were measured, and the correlations between these items and the Motivation, Audience Activity, Finding, and Storing factors (table 21 above) were explored. Then, MANOVA was conducted on three independent variables constructed from each Audience Activity factor and on whether or not respondents were active bloggers. These MANOVAs allow comparison of bloggers and non-bloggers, commenters and non-commenters, promoters and non-promoters, and conversation followers and non-conversation followers across seven categories: Motivations, Activity, Finding and Storing behaviours, , Usage Intensity and experience of Information Overload, and finally demographics. Responses to the open-ended survey question: "Please suggest some ways in which your blog experience could be improved" were coded into categories and then grouped into six items. The nine interviews with blog readers were also analyzed to help answer the third research question.

5.4.1 Usage Intensity profile of sample population

Almost 30% of the sample population read more than 10 blogs daily (figure 4), but only 17.6% spent more than 9 hours per week reading blogs (figure 5). The question capturing frequency of consulting or connecting with the blogosphere (Figure 6) was not part of Ip and Wagner's conception of usage intensity. Hence this question expands the field of study. Most people do not access blogs through mobile devices, but almost 24% do at one time or another (figure 7).

The answers to these questions indicate habitual blog reading in respondents. The results might also reflect how frequently some blogs are updated. In addition, the use of tools for keeping track of blogs may influence this metric of usage intensity.
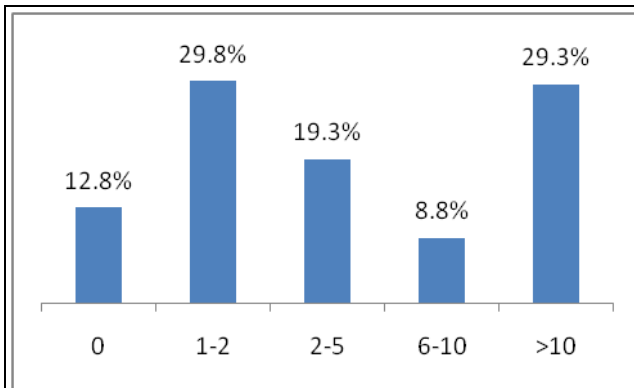
Figure 4: "How many blogs do you read daily?"
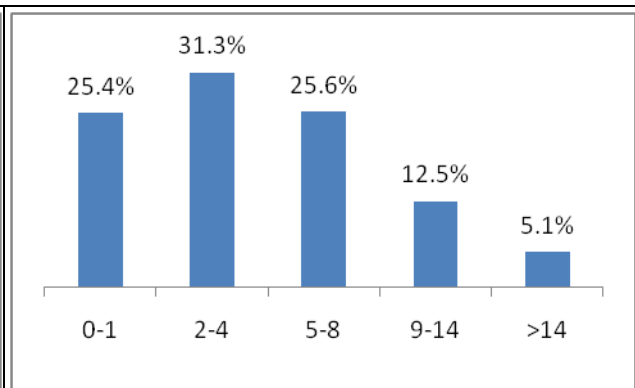
Figure 5: "In an average week, roughly how many hours do you spend reading blogs?"
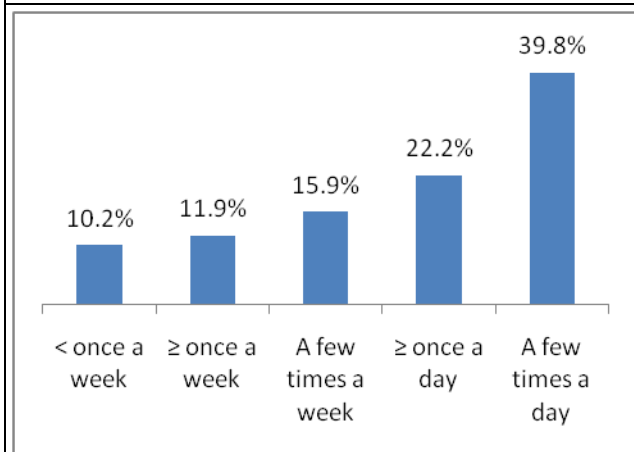
Figure 6: "In an average week, roughly how often do you look at blogs?"
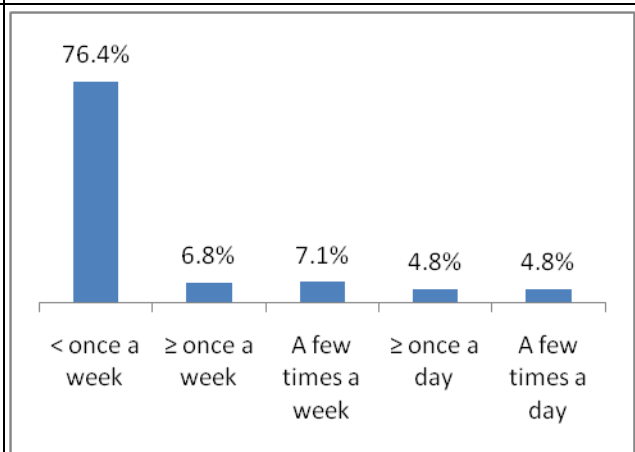
Figure 7: "How often do you read blogs on a mobile device?"

5.4.2 Information Overload profile of sample population

The profiles of Information Overload due to the length (figure 8) and number (figure 9) of blog posts are very similar. The number of blog posts respondents want to read seems to be a significant problem for 14% of the sample population, almost double the 7.8% for whom length is a significant problem. These results indicate that the respondents feel more overloaded by the number of blog posts rather than the length of blog posts.

The greater concern with an inability to read all the blogs desirable may reflect preferences in reading style; for example, by skimming, a reader can abandon a long blog post once its direction is clear. By contrast, those desirable blogs never encompassed remain forever unknown, outside of the range, time or power of the reader.

Figure 8: "I sometimes get annoyed/overwhelmed by the *length* of blog posts I want to read."

Figure 9: "I sometimes get annoyed/overwhelmed by the *number* of blog posts I want to read."
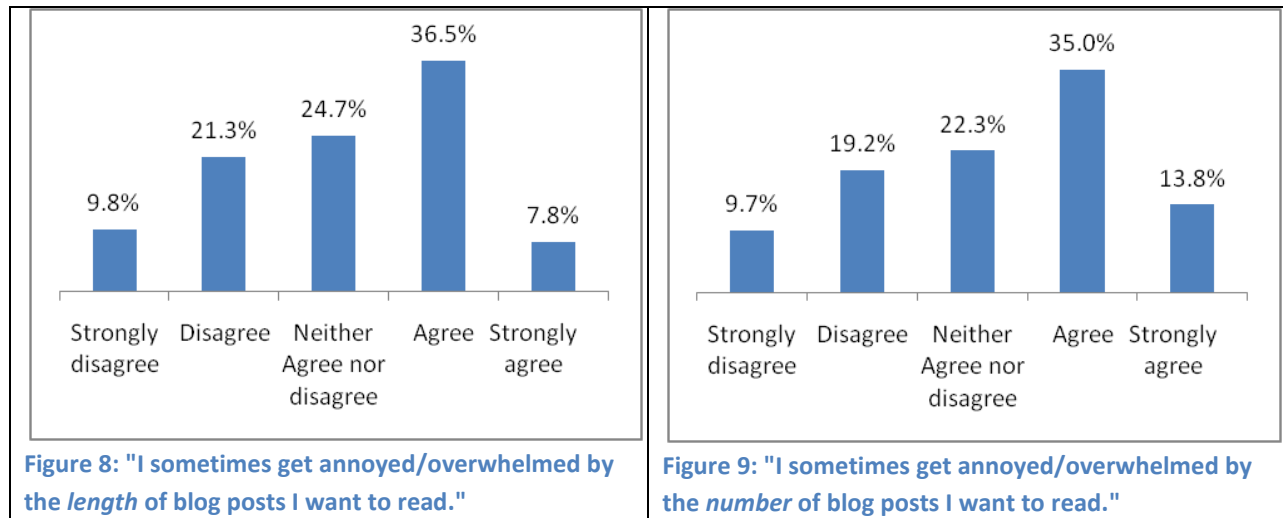
5.4.3 Correlation Analyses

I conducted two partial correlation analyses – one with summated scales and the other with factor scores – across seven categories: motivations, audience activity, finding and storing behaviours, usage intensity and experience of information overload, and finally demographics. Each correlation was investigated separately while controlling for the effects of the other variables and the demographic data. The results of both analyses are compiled in figures 10 and 11 in Appendix IV.

The factor scores (§5.2.1 – §5.3.2) were constructed to be orthogonal, meaning that there is no correlation between the factor scores within each category; e.g., none of the Motivation factors are correlated with each other. However, controlling for several possibly relevant variables induces a few negative correlations, which I do not address. The scales, on the other hand, reveal significant correlations within motivations, audience activity, and ways of finding blogs. Among motivations, 'Expression and Affiliation' is correlated with 'Blogger Identity' (p < .01),

and 'Information' is correlated with 'Political Discussion' (.01) and 'Convenience' (.05). 'Commenting' is correlated with both 'Promoting' (.01) and 'Following Conversation' (.05). 'Searching' is correlated with both 'BSE Browsing' (.01) and 'Link Browsing' (.01), which is likely a reflection of both the ubiquity of blogs and the prevalence of search engine use.

The factor scores reveal several correlations. 'Expression and Affiliation' is strongly correlated with both 'Commenting' (.01) and 'BSE Browsing' (.01), and slightly negatively correlated with 'Searching' (.05). Accessing blogs for 'Information' is negatively correlated with 'BSE Browsing' (.05). Accessing blogs for 'Political Discussion' is correlated with 'Following Conversation' (.01) and with keeping track of blogs by 'Remembering' (.01). Accessing blogs for their 'Convenience' is also correlated with 'Remembering' (.01). 'Following Conversation' is correlated with both 'BSE Browsing' (.01) and 'Link Browsing' (.01), and with 'Remembering' (.05). 'Promoting' blogs is also correlated with 'Remembering' (.05). There is a strong correlation between 'Subscribing' to blogs and the number of blogs one reads daily (.01), and a lower but equally significant correlation between 'Subscribing' and experiencing information overload due to the number of blogs one wants to read (IO#) (.01). The number of hours respondents spent reading blogs weekly is also correlated with IO# (.01). All measures of 'Usage intensity' are strongly inter-correlated (.01), as are both measures of 'Information Overload' (.01).

The factor scores reveal significant correlations that the summated scales do not. 'Promoting' blogs is correlated with accessing them for both 'Expression and Affiliation' (.01) and 'Information' (.01). 'Following Conversation' is correlated with accessing blogs for the 'Blogger's Identity' (.01). 'Searching' is slightly negatively correlated with accessing blogs for 'Political Discussion' (.05) and for the 'Blogger's Identity' (.05). 'Promoting' blogs is somewhat correlated with all three ways of Finding blogs (.01), though the correlation with 'Searching' is less significant (.05); 'Promoting' is also weakly correlated with IO# (.05). 'Remembering' blogs is significantly correlated with all three ways of Finding blogs (.01), and 'Subscribing' is weakly correlated with 'BSE Browsing' (.05).

The scales alone suggest a significant correlation between reading blogs for 'Information' and 'Subscribing' to them (.01), and a weak negative correlation between 'Subscribing' and 'Following Conversation' (.05). There is a weak correlation between 'Commenting' and how frequently respondents check blogs (.05), and a week negative correlation between 'Remembering' and how many blogs respondents read daily (.05).

Correlations also exist between 'Expression and Affiliation' and age (.01) and blog experience (.01), as well as a weak correlation between 'Blogger Identity' and internet experience (.05). Negative correlations exist between 'Promoting' blogs and age (.01), and between 'Following Conversation' and education (.01). Weaker but positive correlations exist between 'Searching' and age (.01), and between 'Link Browsing' and education (.05). The number of hours spent reading blogs weekly is correlated with blog experience (.01). Among the Demographic variables, there is a slight correlation between income and the frequency of accessing blogs from a mobile device (.05).

5.4.4 MANOVA

I chose to examine the weblog audience through the Audience Activity they engage in. New variables were created to represent respondents as being of a certain 'type'. If a respondent's score for any of the three Audience Activity *factors* was greater than one standard deviation above the mean, he or she was considered to be a reader of that 'type', in the same sense that a user is either a 'blogger' or a 'reader'. MANOVA (Multivariate Analysis of Variance) was then used to compare bloggers and non-bloggers, and to explore how readers who tend to comment, promote, or follow conversation differ from their counterparts across the *scales* in each category of motivations, audience activity, finding and storing behaviours, usage intensity, experience of information overload, and demographics. The factor scores effectively allow comparison of individual readers with the entire population of readers, which has a mean of zero and a standard deviation of one. The scales allow comparison of individual readers with respect to the Likert scale from "Strongly Disagree" to "Strongly Agree"; for example, the top 25% of respondents who hold motivation 'X' might not "agree" with (not score > 3 on) the statement in question. The results are presented in tables 22-25 below.

Table 22: MANOVA between bloggers and pure readers

	Bloggers n = 96	**Pure readers** n = 204	Overall Mean
Expression and Affiliation *	3.3	2.4	2.9
Comment *	3.3	2.5	2.9
Promote **	3.2	2.6	2.9
Link Browsing *	3.9	3.5	3.7
Subscribe *	4.0	3.1	3.5
Usage Intensity sum *	3.6	2.8	3.2
hours/week *	2.8	2.2	2.5
blogs/day *	3.7	2.8	3.3
frequency/week *	4.3	3.5	3.8
*: p < .001, power > .99 **: p < .01, power = 0.783			

Table 23: MANOVA distinguishing frequent commenters

	Frequent Commenters n = 54	The rest n = 246	Overall Mean
Expression and Affiliation *	3.4	2.6	3.0
Usage Intensity sum **	3.5	3.0	3.2
frequency/week ***	4.2	3.6	3.9
*: p < .001, power > .99 **: p < .01, power = .801 *** p <. 01, power = .882			

Table 24: MANOVA distinguishing promoters

	Promoters n = 45	The rest n = 255	Overall Mean
Link Browsing *	4.0	3.6	3.8
frequency/week **	4.1	3.6	3.9
*: p<.05 power = .706 **: p<.05 power = .631			

Table 25: MANOVA distinguishing frequent conversation followers

	Frequent Conversation Followers n = 60	The rest n = 240	Overall Mean
BSE Browsing *	2.4	1.9	2.2
Link Browsing **	4.0	3.6	3.8
Remembering ***	3.2	2.7	3.0
IO length ****	3.6	3.0	3.3
*: p < .01, power = .958 **: p <. 01, power = .751 ***: p <. 01, power = .989 ****: p <. 01, power = .910			

Both Bloggers and Commenters are significantly motivated by 'Expression and Affiliation'. Bloggers have a much greater tendency to 'Comment' than non-Bloggers. They are significantly more likely to 'Promote' and use RSS, and somewhat more likely to care about 'Blogger Identity' and to 'Link Browse'.

Commenters are significantly motivated by 'Political Discussion'. Commenters spend more time reading blogs, read more blogs per day, and check blogs more frequently than non-commenters, although not as much as bloggers.

Interestingly, 'Conversation Followers' tend to keeping track of blogs by 'Remembering' more than their counterparts. It stands to reason that the *length* of blog posts causes them more 'Information Overload' than the average reader. Their use of 'BSE Browsing' suggests blog search engines can help readers to 'Follow Conversation', but the low overall mean of 'BSE Browsing' suggests that there is room for improvement.

5.4.5 Analysis of responses to the open-ended survey question and interviews

Survey respondents were asked to suggest some ways in which their blog reading experience could be improved. The responses were coded by grouping similar items together. After this process of data reduction, six areas for improvement emerged: comments, blog aesthetics, navigation within blogs, navigation in the blogosphere, RSS-aggregation, and miscellaneous. Duplicate responses were counted, and alternate wordings were preserved to enrich understanding of the responses. A condensed summary is shown in Appendix V. Respondents wanted comments to be moderated for both quality and civility (n = 7), and to have a threaded, tree structure (4) to facilitate both having and following conversations between comment(er)s.[24]

Many wanted more concise writing and/or summaries of blog posts up front, as a first paragraph (14). Readers wanted fewer ads and cleaner, simpler layouts, with fewer colours and

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[24] N.B. some blogs (e.g. community blogs and blogs affiliated with journalism) tend to have many more comments than other blogs.

a legible typeface (20). One respondent articulated wanting "easier methods of changing how a page displays."

Archives should enable a continuous chronological reading of the blog and provide a better overview of its entire history (5). Searching within blogs needs to be improved (3), perhaps by highlighting the search query terms in the results as Google does (2). Navigating through tags would be improved if synonyms worked, and tag lists would be better represented in a network or tree structure of headings (4).

Blog search engines could improve their filtering and the presentation of their results in several ways:

- By filtering out duplicate or near-duplicate posts; these constitute noise for weblog readers (5).

- By giving readers the ability to "select certain types of posts"; this would necessitate a typology of posts (8).

- By providing a means of filtering out bad writing (7).

- By improving the relevance of their content; e.g., users sometimes search for subject-specific content (e.g., linguistics) (4).

- By giving recommendations of similar blogs to read (7); this necessitates some metric(s) of similarity.

- By giving users a way to judge the credibility of blogs – both the accuracy and completeness of arguments (9). Readers often want sources (8) – a link is better than a citation – and the acknowledgement of "dissenting viewpoints". Some readers emphasized wanting less opinion, and "accountability for writers".

Respondents using RSS aggregators wanted to have the full blog post and comments available in their feed aggregators (21). They wanted functionality to filter and organize their feeds (15), and recommendations of similar blogs and feeds (8), perhaps rated highly by other users. Many

users wanted better compatibility with mobile devices (7) and faster loading times (3), while some respondents wanted ways to reduce their blog reading (5), or more time to read (6). [25]

The interviews provided valuable context for discussion. Each interview transcript was coded into five sections: one for each research question, one for the respondent's understanding of weblogs, and one for any other interesting information. Common and contrasting themes emerged when the coded transcripts were analyzed together, such as why some readers did or did not post or read comments, and how the update frequency of blogs influenced some readers' reading habits. This was done manually, without the use of software. These themes are discussed throughout the discussion section.

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[25] Some examples of good tools are Yahoo pipes, Gmail filters, RSSaid, "more ad networks like 'The Deck'". Firefox Ad-on 'Brief' headlines view.

6 Discussion

Three main threads emerged from the analysis, roughly corresponding to the three research questions.

The first thread is about growing and harnessing the active audience of blogs to influence the structuration process. In order to encourage and harness audience activity, it is logical to inquire after the different motivations for, impediments to, and social structures enacted by different types of audience activity. Social structures are enacted through audience activity, such as groups of readers evaluating blog posts and individuals adding links directing others to blog posts. Certain audience activities can then be encouraged by gratifying motivations and removing barriers, some of which this thesis found.

The second thread provides context for designing tools by drawing on information about readers' behaviours of finding, reading and keeping track of blogs, about how users judge the credibility of bloggers, and about information overload.

The third thread concerns improving tools for the weblog audience. This study found that users desired a set of functionalities to better navigate (browse) the blogosphere and individual blogs. It found that readers wanted meta-information for specialized filtering and personalized recommender systems for new blogs / blog posts to read. This thesis discusses various relational metrics to visualize, customize, and browse the blogosphere.

6.1 RQ1: How do readers interact with blogs? What are the motivations for and impediments to their interaction?

6.1.1 Motivations for reading blogs

Analysis of the survey data found five motivations for reading weblogs which corroborate Kaye's studies: 'Expression and Affiliation', 'Information', 'Convenience', 'Entertainment'/'Blogger Identity' and 'Political Discussion'. This study adds detail to our understanding of the relationships between some motivations for reading blogs. For instance,

deriving entertainment from blogs is correlated with appreciation of bloggers' personalities. Moreover, through correlation analysis, this study furthers understanding of how motivations for blog reading may be gratified.Expression and affiliation is most strongly represented by users' motivation to find and communicate with like-minded people, which the internet facilitates. It appears that the value of like-minded people is complemented by their geographical distance from the user, suggesting that like-minded people who also have a different world-experience are especially valued.

'Information' is the most widely held motivation for reading blogs. It is strongly linked to finding credibility in the blogosphere and to reading bloggers who purport to be experts in some area. 'To keep abreast of current trends' is the weakest component of the information seeking motivation; this likely reflects upon the variables chosen for the survey, in that the conceptual ties between the other three variables which make up the 'Information' factor are stronger.

While Kaye's survey focused heavily on questions that contrasted blogs with the mainstream media, the results of this study indicated that reading blogs as an alternative to the mainstream media is distinct from reading blogs for more general information. Additionally, the 'Social Surveillance' factor that Kaye found, which was concerned with the various viewpoints of others, was not replicated in this analysis – likely because only one question ("for other opinions / points of view") addressed that topic.

The major aspects of 'Convenience' for weblog readers are the ease of finding what they want and the time they save in (not) looking for content. The ability to access weblogs from any place and at any time is less correlated with the above two variables. Additionally, "because I can't find the content anywhere else" was not sufficiently explained by the analysis; and "because [weblogs] are updated frequently" did not load decisively onto the 'Convenience' factor. Kaye's qualitative investigation found the same makeup of the convenience category, but saving time was tied in with the explicit statement that readers used weblogs as a filtering mechanism (Kaye, 2006). Kaye's quantitative study suggested that accessing blogs for specific information,

and the ability to access them from home, were also aspects of the convenience gratification (Kaye, 2005).

My analysis tied keeping up with politics together with participating in political discussions. This is an unfortunate consequence of the wordings of these two questions, which essentially forced together the desire for information about politics and the desire to participate in political discussions. Kaye's quantitative study asked several questions about motivations for reading blogs related to politics. Her "political surveillance" factor reflected readers' use of the blogosphere for information specifically about politicians – "to judge the personal qualities of politicians", "to see politicians' stances on issues", "to see what actions politicians are taking", and "for unbiased viewpoints." In contrast, Kaye's qualitative analysis did not suggest an explicit association between reading blogs for political surveillance and direct information about politicians; rather, it grouped responses into two categories: "to keep up with politics / political issues" and "for specific political perspectives."

'Entertainment' is similar to Kaye's 'Personal Fulfillment' factor; both comprise entertainment, yet 'Personal Fulfillment' includes the desire to 'feel involved', while this analysis linked the 'Entertainment' value of blogs with appreciation of bloggers' personalities and interest in their lives. While 'Blogger Identity' is most strongly correlated with the entertainment value of blogs, it is also strongly correlated with the 'Expression and Affiliation' motive. This is likely why the reliability analysis suggested dropping 'entertainment' from the 'Entertainment/Blogger Identity' factor.

Correlations among the summated motivation scales reveal that reading blogs for 'Information' is correlated with reading blogs for 'Political Discussion' and 'Convenience'. It is logical that people who read blogs for political discussion also read to gain information. Similarly, the correlation between 'Convenience' and 'Information' is understandable given that 'Convenience' reflects the ease of finding content. It is also logical that reading blogs for 'Expression and Affiliation' is correlated with reading for the 'Blogger's Identity'.

These inter-scale correlations reflect the lack of a formal distinction between "motivations" and "needs" in the Uses and Gratifications framework. This lack of formalism in U&G is understandable because 'Motivations' need to be defined according to the purposes of the study in question[26]. This thesis is interested in motivations, which, if not unique to reading blogs, are gratified by virtue of the weblog format. The purpose of studying the motivations of blog readers is to a) understand what (if anything) is unique about what weblogs offer to readers, and b) to compare readers' motivations for reading blogs with the actions they take in reading them.

Because the weblog format facilitates publication for individuals, it was logical to ask how its gratifications stem from the *characteristics of individual bloggers and/or blogs* (e.g., the 'Blogger Identity' and 'Convenience' factors) and *the affordances of the format for the audience*—i.e., possible 'audience activities', which facilitate the link between Gratifications Sought and Gratifications Obtained.

How and how much the blogger makes use of the affordances of the format – e.g., linking liberally, updating regularly, leaving trackback links, and interacting with her audience – influence the value of the weblog to readers. The most popular blogs are written with software that promotes between-blog connectivity and audience participation (Du & Wagner, 2006).

The U&G perspective conceptualizes audience activity as mediating between GS and GO. Therefore, looking at *how* users use a medium is a prerequisite for investigating how their use of it enables them to obtain the gratifications they seek (or why they use one medium or format instead of another).

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[26] Ruggiero observed that U&G research has tended toward a typology of "motivations for media use in terms of **diversion** (i.e., as an escape from routines or for emotional release), **social utility** (i.e., to acquire information for conversations), **personal identity** (i.e., to reinforce attitudes, beliefs, and values), and **surveillance** (i.e., to learn about one's community, events, and political affairs)" {{176 Ruggiero, T.E. 2000}}. 'Expression and Affiliation', 'Information', 'Entertainment'/'Blogger Identity' and 'Political Discussion' can be seen as mapping onto this typology.

6.1.2 Audience Activity and Gratifications Obtained

Factor analysis of the questions about interacting with blogs found three factors from the typology of audience activity (§ 3.1.5): 'Comment', 'Promote', and 'Follow Conversation'. 'Rating posts' and 'participating in polls' were found to correlate with both 'Promoting' and 'Commenting', to the effect that they were excluded from the final factor analysis. Similarly, 'just reading' weblogs was too common to be correlated with any variable, as for any reader the majority of the time spent reading blogs is spent 'just reading'. Therefore, the factor analysis did not distinguish a 'lurker' type of blog reader from more active readers[27]. If there had been more questions devoted to 'rating' and 'participating in polls' these types of interaction may have emerged as factors.

The 'Comment' factor entails interacting with both the blogger and with other commenters. Comments may include kudos to the blogger, Fisking ("a point-by-point sarcastic and cutting refutation of a blog entry or news article" (Kaye, 2006)), trolling (acting in a deliberately provocative way, rather than with authentic engagement), asking questions and/or adding to the discussion, sometimes adding information in the form of links, and adding trackbacks (thereby creating inter-weblog conversation). For example, MR is an occasional commenter. He comments in response to extremes – "brilliant" or "preposterous" posts or comments – either to contribute or to be inflammatory.

This research found a strong correlation between 'Commenting' and 'Expression and Affiliation' in both the summated scales and the factor scores. This is further evidence that commenters want to be responded to. They want to be assured that their comments are not falling on deaf ears. To encourage discussion, it is therefore important to gratify the 'Expression and Affiliation' motivation for reading weblogs. The scales revealed correlations between 'Commenting' and the other audience activity factors, and a small positive correlation with how frequently

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[27] While it might seem that merely lurking is not worthy of mention, it is significant because of software that shows bloggers the amount of traffic they receive, and the referring sources. Many bloggers – especially professional – value the number of unique page views they receive (Olsen et al., 2009).

respondents' checked blogs. The factor scores suggest a small positive correlation between 'Commenting' and 'Link Browsing'.

The two questions which form the 'Promote' factor suggest that people who share widely seem to share with individuals as well. The factor was named 'Promote' instead of 'share' because readers who share blog posts are effectively promoting the blogger's content. They are also providing a filtering service to their friends and furthering the diffusion of information through the internet.

In promoting content, readers are implicitly defining themselves by the information they share, implying *this is what I'm reading, what I find interesting and credible, and what I think others should care about.* Promoting is also a low-overhead way of building one's social capital. BH is a 'Promoter'. He promotes content as part of his self-image; it is something he feels he is "known for". He mostly promotes through Twitter, using Facebook and Twitter for different facets of his online identity. 'Promoting' is weakly correlated with 'Remembering'. The factor scores also suggest that 'Promoting' is correlated with both 'Expression and Affiliation' and 'Information', and weakly correlated with all the 'Finding' factors and 'Information Overload' due to the number of blogs respondents wanted to read.

The makeup of the 'Follow Conversation' factor suggests that trackback links are the main mechanism (we might say 'functionality' or 'technology') that readers use to follow conversation between bloggers. The TTF perspective would suggest that trackback links fit best with the 'tasks' inherent in following conversation. Based on the correlations between 'Follow Conversation' and the questions pruned from the factor analysis, other functionalities that readers may be using to follow conversation between blogs include searching within the blog and using blogrolls, archives, and in-post links.

Both the scales and the factor scores reveal correlations between 'Following Conversation' and 'BSE Browsing', 'Link Browsing', and 'Remembering'. The factor scores also showed correlations between 'Following Conversation' and reading blogs for 'Political Discussion' and the 'Blogger's Identity'.

While 'rating posts' and 'participating in polls' were not part of the factor solution, their loadings onto the factors that did emerge are worthy of discussion. In decreasing order of strength, significant correlations emerged between 'rating' and 'Promoting', 'participating' and 'Promoting', and between 'participating' and 'Commenting'. A correlation between 'rating' and 'Promoting' makes sense because both involve the reader evaluating the post (e.g., determining if it is worth promoting), and because the mechanisms (icons) for rating and promoting are in the same area, at the end of posts. 'Rating' and 'Promoting' also both involve an element of self-expression. A correlation between 'participating' and 'promoting' makes sense because both invoke the feeling of being involved—with the blogger, the blog community and with the friends with whom one shares the post. At the same time, the *absence* of a correlation between 'rating' and 'Commenting' makes sense, because the expressivity of a comment makes adding a 'rating' largely redundant.

6.1.3 Impediments to interaction

In order to promote constructive discussion and to use the interactive potential of the weblog format to harness the audience we need to understand barriers to rating posts, participating, and commenting. These barriers are most prevalent in relation to commenting. They include requiring registration and prohibiting anonymous commenting. Further, readers are disinclined to comment if they are dissatisfied with the level of the existing discussion, if the comments are not moderated, and if the comment section is poorly organized. Commenting can be encouraged if comments are responded to – both by the blogger and by the other commenters.

KS refrains from commenting because he feels he has nothing to add; he rarely reads comments because he finds they are mostly just kudos to the blogger. AH's commenting behaviour is partly determined by the level of pre-existing discourse and its social structure; if he observes that people are talking past each other, he sees no reason to comment. Because he has rarely seen any commenters have fruitful interaction, he believes it needs to be easier to comment, or it is not worth one's time to register. Similarly, AH would contribute to blogs by rating posts if he did not have to sign up for an account. RB wants to "get involved in the

community" of people who read a blog. He might post comments, but again the requirement of registering to do so is a barrier. He would also want other readers to respond to his comments.

RB noted that the organization of comments is frustrating, and it often means that they are too time consuming to read. Respondents to the survey question about improving the experience of blog reading wanted comments to be moderated for both quality and civility and to have a threaded, tree structure to facilitate both having and following conversation between commenters. Facilitating conversation is especially important in community blogs and blogs affiliated with journalism, which tend to have many more comments than other blogs.

6.2 RQ2: What behaviours do readers report and exhibit in finding and keeping track of blogs?

6.2.1 Finding blogs

The factor analysis revealed three ways of finding blogs: 'BSE Browsing', 'Link Browsing', and 'Searching'.

The first factor was labelled 'BSE Browsing' to reflect readers' use of blog search engines. It comprised "By searching "what's popular?"", "With a blog search engine (i.e. Technorati)" and "By browsing categories." Recall that Technorati supports both searching and browsing behaviours; it also supports searching for "what's popular". Searching for "what's popular" echoes the 'Getting on the Bandwagon' motivation for blog reading found by (Huang et al., 2008), which was linked with 'Interaction' and 'Word of Mouth Intentions'. These findings seem to be corroborated by correlations found in this study. Both the scales and the factor scores suggest that 'BSE Browsing' provides support for gratifying the 'Expression and Affiliation' motivation, 'Following Conversation', and 'Remembering'; 'BSE Browsing' seems to be less useful for gratifying the 'Information' motivation. The factor scores alone suggest some synergy between 'BSE Browsing' and both 'Promoting' and 'Subscribing'.

'Link Browsing' (via links from a blog and links from a website) suggests an immersive experience of the blogosphere wherein users roam from blog to blog. Following links from another website (perhaps a blog portal) suggests that users know they are navigating into the blogosphere, and thus browsing it intentionally. 'Link Browsing' behaviour supports 'Following Conversation'. Among the factors, 'Link Browsing' is also positively correlated with the other audience activities – 'Commenting' and 'Promoting' – and with 'Remembering'.

Finding blogs may often be an incidental outcome of 'Searching' with regular search engines like Google. Blogs frequently appear in Google search results. When ML looks for information on a potential purchase, he often reads the blogs that pop up. KS described searching for information on an academic author/topic and finding the author's blog in the process. 'Searching' has a small negative correlation with 'Expression and Affiliation'. Among the scales, it is correlated with the other behaviours of finding blogs, which speaks to the ubiquity of search engine use, and with experiencing 'Information Overload' due to the length of blog posts, which supports the idea that 'Searching' is goal-directed behaviour, confounded by superfluous information. Among the factor scores, 'Searching' has a small negative correlation with the 'Political Discussion' and 'Blogger Identity' motivations, and it has a positive correlation with 'Remembering' blogs, which it supports by helping readers retrace their steps.

Data from the interviews pointed out that readers also find blogs from the 'Promoters' in their social network. For instance, AB reads what his friends send him; his social network is his filter or recommender system. This finding underscores the significance of 'Promoters'; they facilitate what can be called a more passive finding behaviour.

Another aspect to finding blogs is actually making the decision to read them. Part of this decision involves evaluating the credibility of the blogger. MR cited grammatical correctness and good writing as requisite for credibility. AH judges the credibility of bloggers by their reading lists, that is, what their sources are. The blogroll is sometimes a source for this information at a glance. NF judges the credibility of blogs by whether they are referenced by sources known to her. Information in the signature and/or profile is also meaningful for her. At

the same time, her perception of credibility is influenced by the bloggers' impartiality. Bloggers appear impartial if they do not appear to have an agenda like pushing a product; however, bloggers can still influence NF's purchasing decisions. Similarly, AB rarely reads anonymous blogs; he wants there to be "a greater culture of accountability on the web".

A significant problem for readers seeking information is repetition. AB sees significant duplication in blogs. When AH was reading about the election in Iran, he found that "some news blogs were completely copying other blogs." There is a need for tools that reduce redundancy while helping readers to find the information they want.

6.2.3 Keeping track of blogs

The factor analysis confirmed the two suggested methods of keeping track of blogs (§ 3.3.2): 'Remembering' and 'Subscribing'. 'Remembering' might be a bit of a misnomer because the factor comprises functionalities which aid memory, as well as memory itself. Functionalities like Firefox's "wonder bar text recall" would logically be grouped with the 'Remembering' factor. Among the factor scores, 'Remembering' is correlated with all of the 'Finding' factors, which is logical, because remembering something involves knowing how to relocate it.

MR uses his horizontal bookmark bar for things he reads regularly, and his vertical bar for things he knows he will check later. He maintains his bookmark collection by pruning it, but quite rarely. BH does not use RSS or bookmarks because he found he will not go back to them. To keep track of things he wants to read on the web, he relies on his memory and an idiosyncratic storing technique (taking screen shots and annotating them).

Thus, 'Remembering' behaviour includes storing blogs for regular reading and storing them to be able to look at later. JN wants his reading lists – what he bookmarks – to be accessible to his friends, colleagues and students. This is an example of a passive promoting action.

For those who do use RSS feed aggregators, 'Subscribing' entails receiving, in a single location, all updates to the blogs that the user subscribes to. This creates complications when blogs update at different frequencies. ML uses his RSS aggregator (iGoogle) for several blogs – mostly

community blogs like Reddit, which he views as in a grey area of 'not quite a blog' – which he reads daily. He finds that the frequency with which new posts are made in any blog he reads has to match roughly with the other blogs in his reader. A blog with a low update frequency goes to the bottom and gets ignored. He does not use the functionality for different tabs in iGoogle because he perceives adding tabs to require, like bookmarking, a constant active role. He is not willing to spend more effort keeping track of blogs.

AH uses the Firefox web browser's "wonder bar text recall", which aids memory by finding the desired URL from the input of a few letters or words. He also finds that the update frequency of the blogs he reads drives the frequency at which he checks them. For example, he checks the humour-oriented Failblog once every three or four days, for five to ten posts, which he finds to be the right amount for one sitting. For NF, infrequent updating of her family's blogs leads to sporadic reading phases. She likes to catch up in chronological order, but the organization of archives makes this difficult. ML's link browsing leads him to occasionally absorb a large portion of a blog all at once, reading the blog as "a one-time thing". He feels that the archives could provide better support to get an overview of the whole blog, and to present the blog chronologically.

From the negative loading of 'memory' onto the 'Subscribing' factor, it seems that using an RSS feed aggregator substitutes for using one's memory. ML says of using his RSS reader, "if it's not on there, I'll never look at it." He goes on to say that the "social news aggregator [sites like Metafilter and Reddit] ... is my window to the world."

'Subscribing' is quite strongly correlated with the number of blogs respondents read daily, and also shows a moderate correlation with 'Information Overload' from the *number* of blog posts respondents want to read. These correlations make sense because RSS is a technology which streamlines the reading of blogs. An initial investment in blog reading could beget RSS use, and RSS use would likely beget more blog reading. This positive feedback loop logically leads to some feeling of information overload. Notably, the 'Convenience' motivation for accessing blogs is not correlated with 'Subscribing', but it is correlated with 'Remembering'. The same

holds true for accessing blogs for 'Political Discussion'. Among the scales, 'Subscribing' is correlated with accessing blogs for 'Information'.

The interviews suggested a few different reading behaviours: regular reading, sporadic phases, and "one-time thing". Whether a user reads regularly or in sporadic phases depends significantly on the updating frequency of the blog. "One-time thing" reading is often the result of happening across a blog in the course of searching, in which readers spend some length of time consuming a large portion of the blog – usually not in chronological or reverse-chronological order. Sporadic reading, and especially "1-time thing", will benefit from improvements to the archives and tags that facilitate reading chronologically and getting an overview of the entire blog. These are discussed in the subsequent section.

6.3 RQ3: How can the current technologies/tools for finding and keeping track of blogs be improved upon?

Drawing from the interviews and the answers to the open-ended survey question about improving one's blog reading experience, this thesis found several areas for exploration.

Building on the results discussed above, archives should enable a continuous chronological reading of the blog so that multiple posts can be consumed in the sequence they were written in. Similarly, it would be useful to be able to see and navigate to all the post titles from a single list, rather than an expandable archive. Tags could be better navigational tools if synonyms worked and if they were represented in a network or tree structure of headings. This is important for the behaviour of sporadic reading phases, which result from mismatches in updating frequency and reading frequency, and, when using an RSS aggregator, from mismatches between the updating frequencies of several blogs. Better overviews will also support the reading behaviour of consuming a blog in a single session. Indratmo and Gutwin's tool, iBlogVis, attempts to do this; they found that their visualization is most beneficial to content that does not lose value with age (Indratmo & Gutwin, 2008). Deleted or dead links are often problematic for readers who want to retrieve content from the same place they found it.

If functionality to improve gaining an overview of the entire blog is available for bloggers (perhaps in the form of wordpress widgets), they should make use of it to encourage reading. Similarly, bloggers should take note of the fact that many respondents wanted more concise writing and/or abstracts or summaries of blog posts up front, as a first paragraph. These findings suggest that bloggers need to be encouraged to follow some practice of writing 'abstracts' for their posts. Predictably, readers also wanted fewer ads and cleaner, simpler layouts, with fewer colours and a legible typeface; all this is a desire for reduced information overload.

For navigating the blogosphere, one respondent wanted "A visual representation of the relevant blogs in a part of the blogosphere", so that from a focal point of one blog, the reader could see "how and how closely other blogs are related." This reflects a desire for better support for browsing behaviour, which many tools are trying to offer. Useful types of relations to browse that have been discussed include: content similarity (through textual clustering (Schuff et al., 2010)), similarity of interests and geographical location (see: Campbell et al., 2005). The same reader wanted "An easy, structured way to follow inter-blog discussions or arguments". This challenge has been met by Vizblog, which facilitates conversation discovery through a graph with links depicting citations and similarity of content (Tauro et al., 2008). Similarly, for readers judging credibility and homogeneity of opinion, metrics of citation overlap might be valuable.

Searching behaviour should be supported by filtering out duplicate or near-duplicate posts, as these constitute noise for weblog readers. Similarly, a means of filtering out bad writing – perhaps through a grammar-based metric – was desired. Respondents also wanted the ability to target or filter out "certain types of posts". This would necessitate a typology of posts, e.g. summary posts in blog conversations (Efimova & de Moor, 2005). Identifying summary posts might be useful for following conversations for Vizblog, for example.

In general, searches for subject-specific content (e.g. linguistics) could be improved. AH uses Google alerts, which consists of subscribing to the results of a Google search so that the user is

notified when new results appear. He wants to be able to filter out recurring irrelevant results. One might personalize a recommender system by allowing readers to improve the filtering over time.

Users wanted a way to judge the credibility of blogs – both the accuracy and completeness of arguments. Readers often want links to sources, and the acknowledgement of "dissenting viewpoints". Some readers emphasized wanting less opinion, and more "accountability for writers".

Users of blog search engines wanted recommendations of similar blogs to read. This necessitates some metric of similarity; a few possibilities were described above. In selecting metrics of similarity, designers must ask of the users who want similar blogs, what their motivations are for reading blogs. Users may want to filter out (or focus on) redundant opinions, facts and sources. In reducing quantitative information overload, it is ideal to parse down to only one of each of these. However, due to cognitive information overload, it may be necessary to emphasize the most 'important' of these. What is needed – or, at least, should be tried out – is the supplanting of the metric of authority constituted by citation analysis, links, etc. by content-associative tools (Schuff et al., 2010). This should prove a productive method for winnowing out the chaff.

RSS users also wanted recommendations of similar blogs and feeds to read; one criterion suggested was being rated highly by other users; "Feeds that Matter" is an example of a tool that addresses these concerns (Java et al., 2007).

Respondents using RSS aggregators wanted functionality to filter and organize their feeds, and "details on demand" functionality to have the full blog post and comments available in their feed aggregators. Other interface concerns included better compatibility with mobile devices and faster loading times.

6.4 Limitations of the Study

Analysis of the survey results revealed some specific limitations. For example, some survey questions overlapped, and some concepts were not adequately represented. The questions about motivations for reading blogs were limited so as not to make the survey too long, precluding a strong confirmation of earlier results. A seven point Likert scale instead of a five point scale would have better met the assumption of continuity in factor analysis. However, because Kaye used five point scales, this provides a more precise comparator for confirmatory results.

Although the survey sample size was comparatively large – 352 usable responses – the generalizability of the results is questionable. The sample population was skewed by the selection method: for example, the education profile is skewed towards higher levels. On the other hand, blog users tend to have higher than average education levels. While blog readers tend to be highly educated, respondents seem disproportionately so. The sample is largely Canadian; differences between Canadian, American, and other cultures' blog reading patterns are not well articulated in the literature and are not broken out in this study.

The interview sample was a different look at these kinds of questions. It contributed to original thinking. Most interview subjects were chosen because of their fluency with internet technology and their ability to articulate their experience. For this reason, and because only ten subjects were interviewed, the interviews are not entirely representative of the blog reading population.

The adaptation of the three theories in the theoretical framework depends, necessarily, upon a set of assumptions. The most significant of these are that audience activity drives gratifications obtained, that gratifications sought drives audience activity, and that 'usage intensity' is a suitable measure of fit. Re-examination of these assumptions might provide valuable distinctions in the result; alternatively, such a re-framing might yield different questions and respective analysis.

7 Conclusion

7.1 Summary of results

The results of this work largely confirm the established motivations for reading blogs. They also confirm connections between specific motivations for reading blogs and specific audience activities, in particular, Expression and Affiliation and Commenting.

Building on this confirmatory work, the thesis identifies impediments to audience activity, most significantly to commenting. They include requiring registration and prohibiting anonymous commenting. Identifying these barriers to audience activity is helpful to bloggers: it suggests ways that they can generate more and more fruitful interaction, and better promote their blogs. Removing impediments to commenting will help organizations to generate and harvest customer feedback. Additionally, for society at large, understanding the barriers to audience participation is necessary to promote pluralistic decision-making, which requires that "as many users as possible [can] add to the conversation in a meaningful way" (Schuff et al., 2010).

Through an analysis of the structural features of the weblog, this thesis has been able to propose a typology of audience activity, which conceptually links adaptive structuration theory with the theory of uses and gratifications. Three different 'types' of structural features available for blog readers each correspond to a 'kind' of audience activity. Navigational, contributive, and promotional audience activities play a role in enacting social structures among blog consumers and their social networks. The idea that social structures are enacted through audience activity is fundamental for designers of tools. JN, a heavy blog user who also makes use of the weblog format as an educator, observes that "the biggest problem [he faces] is actually trying to use blogs in very specific contexts." The typology of audience that this thesis proposes can help someone like JN to use the weblog format in specific contexts.

This thesis provides a basis for understanding how readers judge the credibility of bloggers they may read. Judging credibility can be thought of as another 'kind' of audience activity. This thesis found some of the structural features and social structures that readers use to judge credibility:

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grammatical correctness and good writing, reading lists and sources, the information in the signature and/or profile, whether a blog is referenced by known sources, and the appearance of impartiality. Users also wanted a way to judge both the accuracy and completeness of arguments in blogs. They often want links to sources, and the acknowledgement of "dissenting viewpoints". Some readers emphasized wanting less opinion, and more "accountability for writers".

In addition to audience activity, this thesis identifies three kinds of reading behaviours: regular reading, sporadic phases, and "one-time thing". Organizations wishing to design intra-office communities – e.g., for knowledge sharing – might infer knowledge acquisition behaviours from the different behaviours of consuming blog content. This finding also supports the designs of tools for interfacing with blogs. For example, Indratmo and Gutwin's tool iBlogVis supports continuous chronological reading of the blog, which is better suited to the behaviours of sporadic reading phases and of consuming a blog all at once.

This thesis found three different behaviours for finding blogs to read: Link Browsing, BSE (blog search engine) Browsing, and Searching. The starting point for examining finding behaviours was a distinction between browsing and searching. In light of these results, it might be better to define 'browsing' as making use of navigational structural features, and 'searching' as using the functionality of (blog-specific) search engines and similar tools. For example, for navigating the blogosphere, one respondent wanted "a visual representation of the relevant blogs in a part of the blogosphere", so that from a focal point of one blog, the reader could see "how and how closely other blogs are related." This reflects a desire for better support for browsing behaviour, which many tools are now trying to offer. Useful types of relations to browse that have been discussed include: content similarity (through textual clustering (Schuff et al., 2010)), similarity of interests, and geographical location (see: Campbell et al., 2005). For readers judging credibility and homogeneity of opinions, metrics of citation overlap might be valuable. The same respondent wanted "an easy, structured way to follow inter-blog discussions or arguments". Academically, this challenge is being addressed by Vizblog (Tauro et al., 2008),

which facilitates conversation discovery through a graph with links depicting citations and similarity of content. Similar capabilities should be made more widely available.

Complementing these findings, this thesis found a desire for personalized recommender systems connected with both blog-specific search engines and RSS aggregators. RSS users wanted recommendations of similar blogs and feeds to read. "Feeds that Matter" is an example of a tool that attempts to address these concerns (Java et al., 2007). The desire for recommender systems is likely a response to the experience of information overload; it represents a desire to offload some of the cognitive work that goes into navigation, judgement, and choosing. To reduce the information overload associated with searching, a few things that constitute noise for readers should be filtered out, including duplicate or near-duplicate posts, and bad writing – perhaps identified through a grammar-based metric. Respondents also wanted the ability to target or filter out "certain types of posts". This would necessitate a typology of posts, e.g. summary posts in blog conversations (Efimova & de Moor, 2005). Identifying summary posts might be useful for following conversations for Vizblog, for example. Respondents using RSS aggregators wanted functionality to filter and organize their feeds, and "details on demand" functionality to have the full blog post and comments available in their feed aggregators. Some interface concerns included better compatibility with mobile devices and faster loading times. In addition, the analysis found an anti-correlation between RSS use and memory. Predictably, readers also wanted fewer ads and cleaner, simpler layouts, with fewer colours and a legible typeface; all this is a desire for reduced information overload. Designers of tools should take note of the fact that RSS feed aggregators seem to (inadvertently) exacerbate readers' experience of information overload due to the number of blog posts they want to read. Not overloading the user is also a challenge faced by recommender systems.

7.2 Further Research

7.2.1 Driving audience activity

While work has been done to understand motivations for reading blogs in general, more work can be done to understand the motivations underlying each type of audience activity. For example, the conjectures made in the discussion section (§ 6.1.2) could be investigated: are 'rating' and 'Promoting' correlated (in part) because they are both expressions of an evaluation? The evaluations readers make in promoting content might be implicit or explicit judgements like "humorous", "interesting", "outrageous", and so on. For example, the evaluation system employed at www.ted.com annotates videos with the words most often used by 'raters' to describe them. Can the correlation between 'participating' and 'Promoting' be attributed to satisfying the desire to feel involved and/or the desire to see what other people think? Is there a distinction to be drawn between 'participating promoters' and 'evaluating promoters'?

Audience activity could be investigated in connection with a different usage of the term "motivations", relating more to the general needs of humans than to the medium in question. For example, Ruggiero observed in 2000 that "U&G research continues to typologize motivations for media use in terms of diversion (i.e., as an escape from routines or for emotional release), social utility (i.e., to acquire information for conversations), personal identity (i.e., to reinforce attitudes, beliefs, and values), and surveillance (i.e., to learn about one's community, events, and political affairs)" (Ruggiero, 2000). Besides these motivations (or gratifications sought), what might drive weblog audience activity? Ruggiero also observed that other studies have "analyzed individual activity in a plethora of psychological and social contexts including media dependency, ritualization, instrumental [use], communication facilitation, affiliation or avoidance, social learning, and role reinforcement" (Ruggiero, 2000).

Studies involving motivations of blog reading in specific contexts like internal corporate blogospheres might connect those motivations to relevant audience activities. Researchers should also look at the impediments to different types of audience activity in more depth—i.e.,

the requirement of registration before one can post a comment. Studies of resistance to using new ICTs introduced in organizations could be a relevant connection here.

The theoretical framework presented in this thesis should be useful in future studies of the weblog format. To expand the scope of the present study, future research might ask blog readers about their reading habits in more depth, e.g.:

- What technologies or tools do you use to read blogs? (e.g. an RSS feed aggregator, a blog-specific search engine). How do you use them?

- What features of blogs do you routinely use, and for what purpose? (e.g. commenting, interactive elements like rating posts and participating in polls, 'promoting' the blog post on a social network site like Facebook, blogrolls for navigational purposes, etc.)

- Do you follow interactions between blogs (i.e. conversations)? How?

7.2.2 Driving structuration

Once an audience activity and the motivating forces behind it have been identified and the impediments to so-acting have been investigated, the outcomes of that activity need to be understood. Adaptive structuration theory suggests conceptualizing these outcomes as social structures, created through structuration – consistent appropriations of the structural features. Some examples of structural features begetting social structures through audience activity are: blogrolls connoting affiliation, and permalinks acting as citations.

Researchers can also take the reverse approach: to first identify (or define) social structures. Silva et al. identified the structural features and social structures that bring about cohesion in Metafilter, which include "explicit ground rules regarding memberships, ..., the availability of profile information, ..., tacit warrants for discerning pertinent posts," et cetera (Silva et al., 2008). For tools intended to help readers follow blog 'conversations', perhaps identifying blog posts which act as summaries of the conversation could be useful (Efimova, & de Moor, 2005), as mentioned (§ 6.3).

In designing tools for interacting with blogs, one could make use of the existing social structures and data that arise from audience activity, like the content of comments, the number of comments, the number of times the item has been "shared", and so on. A more ambitious approach to designing tools is to design new audience activities to get metrics of blog posts. For example, users could be prompted to rate posts in different dimensions, as the talks at www.ted.com are. If we can harness audience activity effectively, perhaps we can elicit particular outcomes through designing social structures. Social structures can also be used as data, artefacts or processes in designing other social structures. We might like to define some socially constructed measure of credibility; for instance, numerical metrics of citation overlaps, or the homogeneity of opinions could be created. At least initially, it is desirable to create a variety of metrics, to compare a variety of perspectives.

Schuff et al. (2010) contend that "a set of mechanisms for the reader to be able to assess the intended purpose of discourse" is "a critical aspect of a functioning public sphere". They adopt a Habermassian perspective of four validity claims we should want to test a blogger against. These are **truthfulness** (factual accuracy), **legitimacy** (consistency with socially accepted norms), **comprehensibility** ("understandability"), and **sincerity** (genuine reflection of author's opinion). I suggest it falls to individual readers to evaluate the blogger's comprehensibility, short of some effective natural language processing (NLP) software. It then falls to other bloggers to evaluate legitimacy, which we might measure through a comment or a post on their own blog authored in response. The blogger himself must measure the sincerity of his message by the response he receives. If he feels his meaning has been mistaken, he must try to correct the responder's understanding (see: Ngwenyama & Lee, 1997). Factual accuracy might best be verified by an algorithm; Schuff et al. suggest www.factchecker.org and another might involve www.wolframalpha.com. Where truthfulness is indeterminable by algorithm, it falls to individual readers to supply evidence in the form of URLs. Wikipedia is an example of social structure that might be used in conjunction with powerful algorithms to verify bloggers' factual accuracy.. Some results from the interviews support this idea. SB, in his use of music blogs, altruistically fills in links; when he finds something he has been searching for he goes back to

the first place he thought to look and adds a link to it at that place. Perhaps readers like MR, who tends to check the sources of bloggers, could be harnessed to create evaluate metrics. Perhaps commenters can be encouraged to contribute links to references.

In summary, this thesis examined weblog reading along several dimensions, including motivations for reading blogs, audience interaction with the weblog format, and the use of tools to find and keep track of blogs. It identified impediments to audience activity and found some of the social structures that readers use to judge the credibility of bloggers. Complementing these findings, this thesis found a desire for personalized recommender systems connected with both blog-specific search engines and RSS aggregators. The vision of this thesis is to understand, encourage, and ultimately harness different types of audience activity to build better recommender systems for blogs.

Appendix I: Breakdown of Factors for Blog Reading Motivations and Outcomes

The following tables (26 – 33) capture the literature about motivations for reading blogs and the associated outcomes, as referenced and discussed in this thesis.

Table 26: Motivations for reading blogs (Chung & Kim, 2008)

Factor Label	Questions loading onto factor
Emotion Management (M = 4.16, SD = 0.76)	• Helped express frustration in dealing with cancer • Helped cope with cancer situations • Given feeling of empowerment not felt through traditional health care providers
Information-Sharing (M = 3.85, SD = 0.80)	• Satisfied with blog information • Helped learn new information by reading blogs • Helped solidify existing relationships
Problem-Solving (M = 2.92, SD = 0.83)	• Helped change current care options • Helped find alternative methods • Helped make better cancer decisions • Helped discuss info with physician
Prevention and Care (M = 2.40, SD = 0.83)	• Helped from further developing other diseases • Helped from further developing cancer • Helped decrease cost of cancer-related healthcare • Helped establish healthy lifestyle • Helped decrease length of hospital stay

Table 27: Desirable and undesirable qualities of diary blogs (Karlsson, 2006)

Essential in an online diary blog	**Unwanted** in an online diary blog
Humour	infrequent updates
Authenticity	boring content, boring topic
good writing	being hard to relate to
nice design	having questionable values
current topics	self-pity, complaining
ability to identify	bad language, vulgarity
photos	bad design

Table 28: Motivations for reading blogs (Kaye, 2005)

Factor Label	Questions loading onto factor
Information seeking and media check	• To check accuracy of media • For information about the war on Iraq and its aftermath • To use as ammunition in argument with others • For information not found in traditional media • Compare online accounts to traditional media • To keep up with main issues of the day • To make up my mind on important issues • To access information from work
Convenience	• To access information quickly • Because information is easy to obtain • To access information at any time • To find specific information that I'm looking for • To access blog information from home
personal fulfillment	• Because it is entertaining • Because it is exciting • Because it helps me relax • To give me something to talk about with others • To feel involved
political surveillance	• To judge personal qualities of politicians • To see politicians' stances on issues • To see what actions politicians are taking • For unbiased viewpoints
social surveillance	• For a variety of viewpoints • To see what the other side thinks • To learn about others' opinions
expression and affiliation	• To make my opinions known • To be in contact with like-minded people
	• "To find out how about issues affecting people like myself" did not load on any factor.

Table 29: Motivations for reading blogs (Kaye, 2006)

Category label	Items coded into category (in order of prevalence)
Blog presentation / characteristics 16.8% of responses	• For links to more information/sources • Depth of information /coverage • Commentary/insight/analysis about news • Up-to-date/timely/scoop others • Non-traditional/different/unedited/unfiltered independence/no gatekeeping/censorship • Admitted bias • Unbiased/balanced presentation of both sides • True/candid/credible • Keep a story going
Convenience 16.1% of responses	• Filtering mechanism; saves me time in looking • Information is easy to obtain / convenient • Can get information quickly / fast
Personal fulfillment 15.3% of responses	• Entertaining • Humor • Interesting • Boredom/diversion/escape • Novelty • Habit
Intellectual/aesthetic fulfillment 14.7% of responses	• Good writing • Enlightening/learn something new • Intellectual discourse/debate/argument/critical thinking skills • Expert opinion/knowledge

Expression/affiliation with bloggers and blog users 10.2% of responses	• Communicating with friends • Interact with people / access news from around the world • Blogger's personality • Sense of community/networking/social connection/sex/friendship • Follow and participate in dialogue/interactivity • To access a specific blogger • Contact like-minded people • Gossip/human interest • To express opinions
Information seeking 8.2% of responses	• Specific • Wide variety • Scientific/technical • Current events/general information • Research/work/school • "for information for my own blog" • Keep up with social issues/trends • accuracy
Anti-traditional-media sentiment 7.8% of responses	• Information not available from traditional media • Avoid media bias • lack of objectivity of traditional media • As an alternative to traditional media • Don't trust/like traditional media
Fact checking 5.2% of responses	• Veriify / compare traditional media and bloggers • Expose others for wrong info / bias / fisking
guidance/opinion seeking 3.4% of responses	• Variety of opinions • To see what the other side thinks • To make up my mind • Support for my opinions
Political surveillance 2. 3% of responses	• To keep up with politics / political issues • For specific political perspectives

Table 30: Motivations for reading blogs (Huang et al., 2008)

Factor Label	Questions loading onto factor
Affective exchange	• I usually keep contact with friends by reading their blogs. • I would spend some time in reading friends' blogs. • I would express my care to friends by reading their blogs. • I can keep informed of my friends' status through blogs. • Leaving a message on my friends' blogs can make our relationship better. • I would like to share experiences with friends on blogs. • I can interact with bloggers through reading their blogs. • Replying to others' blogs can express my feelings.
Information search	• I would search information on blogs. • I can find the information I want on blogs. • I would search on blogs as I need some information. • I read blogs for the purpose of searching information. • It is an easy task to search information on blogs. • I can learn some new knowledge on blogs.
Entertainment	• I would browse blogs when I feel bored. • I would like to spend my leisure time on reading blogs. • Reading blogs can prevent me from feeling bored. • I would read the hot issues on blogs. • I usually do not have specific purpose when I browse blogs. • Reading articles on blogs makes me have fun.
Getting on the bandwagon	• I would read the hot blogs listed on the billboard. • I would read the blogs which are clicked by many people. • I would read the hot articles on blogs.

Table 31: Predictors of blog reading motivations (Chung & Kim, 2008)

2nd block: attitudinal variables (perceived Internet skill level, perceived blog credibility)	3rd block: blog use variables (read, comment, blog)	predicted Gratifications Obtained (GO)
perceived credibility (β = 0.25, *P* < 0.05)		prevention and care . R^2 = 062
perceived credibility (β = 0.40, *P* < 0.01)		problem-solving R^2 = .192
	hosting cancer blog (β = 0.40, *P* < 0.01)	emotion management R^2 =.174
Perceived credibility (β =0.26, *P*<0.05)	posting comments (β = 0.29, *P* < 0.05)	information sharing R^2 =.281

Table 32: Predicted outcomes of blog reading motivations (Huang et al., 2008)

Motivations	Predicted outcomes of blog reading
Affective exchange	Opinion acceptance (β =0.13, *P*<0.05) Interaction intention (β =0.42, *P*<0.01) WOM intention (β =0.36, *P*<0.01)
Information search	Opinion acceptance (β =0.11, *P*<0.01)
Entertainment	Opinion acceptance (β =0.17, *P*<0.01)
Getting on the bandwagon	Interaction intention (β =0.19, *P*<0.01) WOM intention (β =0.32, *P*<0.01)

Kaye constructed regression variates to predict each of six gratifications of blog reading from among the following independent variables: "trust in the government, self-efficacy, interest in news and current events, interest in politics, political involvement since becoming a weblog user, length of time accessing weblogs and the Internet, hours per week on weblogs, level of weblog participation, and demographics."

Table 33: Predictors of blog reading motivations (Kaye, 2005)

Predictors of Motivations	Motivations
• interest in current events • number of hours per week spent on Weblogs • Weblog participation (β=.04, *p*<.05))	Information seeking and media checking
• years on the Internet • Weblog participation • hours per week on Weblogs • interest in current events (β = .08, *p* < .001)	Convenience
• interest in general news (β=.08, *p*<.001) • number of hours per week spent on Weblogs (β=.11, *p*<.001) • weblog participation (β=.14, *p*<.001) • years on the Internet is a negative predictor • (β = −.04, *p* < .05)	Personal fulfillment
• hours per week on Weblogs • years on the Internet is a negative predictor (β=−.06, *p*<.01)	Political surveillance
• general news interest (β=.12, *p* < .001) • Weblog participation (β = .07, *p* < .001) • hours per week on Weblogs (β =.07, *p*<.001) • years on the Internet (β=.05, *p*<.01)	Social surveillance
• Participation on Weblogs (β=.41, *p*<.001) • hours per week on Weblogs (β = .12, *p* < .001)	Expression and affiliation

Appendix II: Participant recruitment messages

Message addressed to bloggers

Dear [name],

I came across [blog] over the course of my research, and I've read it with interest. I'm conducting a survey of blog readers to complete my Master's degree at Ryerson University. The survey asks readers about why and how they read blogs (and Twitter), and about what tools they use to do so. Its purpose is to provide better context for the design of new tools.

Please consider linking to this survey in a blog post. I'll be happy to share the results with you after my degree is complete. And please do take the survey yourself. I need at least 200 responses for the survey to be statistically meaningful. I'm almost half way there. Respondents so far have told me that the survey is interesting and quick to fill out.

http://www.surveymethods.com/EndUser.aspx?DBFF938ED9918A88

Sincerely,

Stephen Kershaw

MMSc candidate, Ryerson University

Toronto, Canada

p.s. Here is a blurb to introduce the survey, though you should feel free to use your own words:

Suggested survey advertisement for bloggers

Dear Blog Readers,

Help design new tools for the blogosphere!

I am collecting data for my master's thesis. I want to understand how existing technology supports the needs of blog readers. This research will direct the creation of new tools to navigate the blogosphere. You can complete this survey in 10 minutes. Hopefully, the survey will provide an interesting opportunity for reflection. I am grateful for your participation.

http://www.surveymethods.com/EndUser.aspx?DBFF938ED9918A88

Sincerely,

Stephen Kershaw

MMSc candidate, Ryerson University

Survey consent agreement

Ryerson University

Consent Agreement

An Investigation of how Blog Readers Use Technology to Meet Their Motivations

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

<u>**Investigators:**</u>

Principal investigator: Stephen Kershaw, MMSc candidate, department of Management of Technology and Innovation (MTI), Ryerson University.

Supervisor: Ozgur Turetken, PhD, Ted Rogers School of Information Technology Management, Ryerson University.

<u>**Purpose of the Study:**</u>

I am collecting data for my master's thesis. I want to understand how existing technology supports the needs of blog readers. This research will direct the creation of new tools to navigate the blogosphere. You can complete this survey in less than 10 minutes. I am grateful for your participation.

<u>**Description of the Study:**</u>

You will be asked to answer a series of questions about your motivations for reading blogs, your use of associated technology, and your reading habits. The survey should take 5-10 minutes to complete.

<u>**Risks or Discomforts:**</u>

There are no foreseen risks or discomforts.

You will be asked for information that could be considered personal. Additionally, you will be asked to reflect on your motivations for reading blogs, your use of associated technology, and your reading habits. You will not be asked for any information that could be used to identify you. You may stop participating in the survey at any time before you have completed it. Please note that the survey data is stored on servers hosted by Survey Methods, located in the United States.

Benefits of the Study:

The potential benefits of this study include gathering and analysing information that will help to improve the design of tools for searching and interacting within the blogosphere.

Confidentiality:

You will not be asked for any information that could be used to identify you.

Voluntary Nature of Participation:

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time.

At any particular point in the study, you may refuse to answer any particular question or stop participation altogether. If you do not complete the survey, your data will not be used.

Questions about the Study:

If you have any questions about the research now, please ask. If you have questions later about the research, you may contact Stephen Kershaw at stephen.kershaw@ryerson.ca

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Research Ethics Board

c/o Office of the Vice President, Research and Innovation

Ryerson University

350 Victoria Street

Toronto, ON M5B 2K3

416-979-5042

Agreement:

Your participation in this survey indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your participation also

indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate at any time.

Interview consent agreement

Ryerson University

Consent Agreement

An Investigation of how Blog Readers Use Technology to Meet Their Motivations

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Investigators:

Principal investigator: Stephen Kershaw, MMSc candidate, department of Management of Technology and Innovation (MTI), Ryerson University.

Supervisor: Ozgur Turetken, PhD, Ted Rogers School of Information Technology Management, Ryerson University.

Purpose of the Study:

I am collecting data for my master's thesis. I want to explore relationships between blogs and microblogs (Twitter) and to understand the evolution of communication over the internet.

Description of the Study:

You will be asked questions about your experience and use of blogs and Twitter. This interview will last approximately one hour.

Risks or Discomforts:

There are no foreseen risks or discomforts. You will not be asked for any information that could be used to identify you. You may stop participating in the interview at any time before we have completed it.

Benefits of the Study:

The potential benefits of this study include improved understanding of changing communication technologies and the repercussions on culture and society. It may inform future research and the design of new tools for interacting over the internet.

Confidentiality:

You will not be asked for any information that could be used to identify you.

Voluntary Nature of Participation:

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time.

At any particular point in the study, you may refuse to answer any particular question or stop participation altogether. If you do not complete the interview, your data will not be used.

Questions about the Study:

If you have any questions about the research now, please ask. If you have questions later about the research, you may contact Stephen Kershaw at kershawstephen@gmail.com

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

<div align="center">

Research Ethics Board

c/o Office of the Vice President, Research and Innovation

Ryerson University

350 Victoria Street

Toronto, ON M5B 2K3

416-979-5042

</div>

Agreement:

Your signature indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate at any time.

Appendix III: Survey questions

1) Do you write a blog?

Yes	No	I used to	I'm planning to

2) Roughly how long have you been reading blogs?

Years	Months

3) In an average week, roughly how many hours do you spend reading blogs?

0-1	2-4	5-8	9-14	>14

4) How many blogs do you read daily?

0	1-2	3-5	6-10	>10

5) In an average week, roughly how often do you look at blogs?

Less than once a week	At least once a week	A few times a week	At least once a day	More than once a day

6) How often do you read blogs on a mobile device?

Less than once a week	At least once a week	A few times a week	At least once a day	More than once a day

For questions 7 – 11, please indicate your level of agreement:

7) "I mostly read blogs…"

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
M1	For links to more sources.					
M2	Because they are updated frequently.					
M3	Because I can't find the content anywhere else.					
M4	Because I can access them anywhere/anytime.					
M5	To save me time in looking for content.					
M6	Because it's easy to find what I want.					
M7	To communicate with friends who have blogs.					
M8	To interact with others like myself.					
M9	To communicate with people in other parts of the world.					
M10	As an alternative to the mainstream media.					
M11	To read about the blogger's life.					
M12	For access to experts.					
M13	Because the blogs I read are credible					
M14	To keep abreast of current trends.					
M15	For entertainment.					
M16	For information.					
M17	To follow politics.					
M18	To participate in political discussions.					
M19	For the blogger's personality.					

		Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree
M20	For other opinions /points of view.					

8) "I mostly read…"

		Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree
T1	Diary blogs					
T2	Blogs about politics					
T3	Humor-oriented blogs					
T4	Gossip blogs					
T5	Audio/visual blogs					
T6	Topic-oriented blogs					
T7	Opinion blogs					
T8	Blogs whose purpose is to link to things (Filter blogs)					
T9	Media monitoring blogs					
T10	Support group blogs					
T11	Blogs that serve as the point of contact for a website					
T12	Blogs that serve to organize and/or solicit participation					
T13	Internal corporate blogs					
T14	Blogs used in education					
T15	Community blogs (e.g. Metafilter)					
T16	Blogs in a community of blogs					
T17	Anonymous blogs, or blogs which withhold a real life identity					
T18	Blogs written by subject matter experts					

9) "When I read blogs, I often…"

		Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree
A1	Rate the post I'm reading					
A2	Participate in polls					
A3	Share a post (via facebook, digg, reddit, etc.)					
A4	Share a post with specific people (via email, instant messaging, etc.)					
A5	Look through the blog's archives					
A6	Follow a link from the blogroll					
A7	Follow the bloggers' links from a blog post					
A8	Follow trackback links from comments to other blogs.					
A9	Follow conversations between two or more bloggers					
A10	Click on ads in blogs					
A11	Further investigate and/or buy a product that a blogger has discussed/reviewed					
A12	Search for content within the blog					
A13	Read comments					
A14	Write a comment to the blogger					
A15	Write a comment in response to another comment.					
A16	Leave a trackback link to my					

		own blog					
A17	Just read.						

10) "I find and/or keep track of blogs I want to read…"

		Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree
F1	With a blog search engine (i.e. Technorati)					
F2	By searching "what's popular?"					
F3	By searching for similar content					
F4	By browsing categories					
F5	With a regular search engine (i.e. Google)					
F6	Via links from a blog you're currently reading					
F7	Via links from another website					
R1	By retracing my steps					
R2	With bookmarks					
R3	With an RSS feed aggregator					
R4	With my web browser's history					
R5	From memory					

11) "I sometimes get annoyed/overwhelmed by…"

		Strongly disagree	Disagree	Neither Agree	Agree	Strongly agree

				nor disagree		
IO length	The *length* of blog posts I want to read.					
IO number	The *number* of blog posts I want to read.					

12) Please suggest some ways in which your blog experience could be improved.

13) Please list any new tools/technologies that you have started using on your computer within the last 6 months.

14) Do you use Twitter?

Yes	No

 (NOTE: If the respondent answers "No", the survey will skip ahead to the Demographics questions.)

15) Roughly how long have you been reading twitter?

Years	Months

16) In an average week, roughly how many hours do you spend reading twitter?

0-1	2-4	5-8	9-14	>14

17) In an average week, roughly how often do you look at twitter?

Less than once a week	At least once a week	A few times a week	At least once a day	More than once a day

18) How often do you read or write tweets on a mobile device?

Less than once a week	At least once a week	A few times a week	At least once a day	More than once a day

19) How many tweets do you send daily?

0	1-2	3-5	6-10	>10

20) How has using Twitter changed your blog reading habits?

21) Please give three reasons that you use Twitter.

22) I sometimes get annoyed/overwhelmed by the number of tweets I want to read.

Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree

23) Demographics

Gender	M				F		
Age	18-21	22-30	31-40	41-50	51-60	>60	
Education	Some high school	High school graduate	Some college/ university	College/ university graduate	Pursuing / obtained a graduate		

							degree
Income	<$20,000	$20,000 - $39,999	$40,000 - $59,999	$60,000 - $79,999	$80,000 - $119,999	$120,000 - $300,000	>$300,000
Roughly how long have you been using the internet?	Years				Months		

Appendix IV: Correlation Analyses

	EA	I	PD	C	B Id	Cmt	Prmt	FC	BSE B	Link B	SE	Rem	Sub	Hrs/w	B/d	Chk/w	IO L	IO #
Expression and Affiliation	1																	
Information		1																
Political Discussion	**0.274****	.164*	1															
Convenience				1														
Blogger Identity	**.289****				1													
Comment	**.393****					1												
Promote						.204**	1											
Follow Conversation			.130*			**.156***		1										
BSE Browsing	**.236****					-.139*		.195**	1									
Link Browsing								.165**		1								
Searching									**.324****	**.233****	1							
Remembering				.164**			.148*	.171**	.157*		.127*	1						
Subscribing								**-.129***			-.152*	**.178****	1					
Hours/week														1				
Blogs/day												-.158	.319**	.363**	1			
#Check/week												.124*		.328**	.435**	1		
IO length											.128*						1	
IO number										.143*			.180**	.159*			.538**	1
Internet Experience					-.144*													
Blog Experience	.157*													.232**				
Age	.149*						-.192**				.146*							
Education								-.196**										
Income																		

Legend

>.299 (yellow)	>.199 (green)
>0 (blue)	<0 (red)
* p < .05	** p < .01
Bold: unique to scales	

Figure 10: Partial correlation analysis of summated scales

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Partial correlation analysis of factor scores

	EA	I	PD	C	B Id	Cmt	Prmt	FC	BSE B	Link B	SE	Rem	Sub	Hrs/w	B/d	Chk/w	IO L	IO #
Expression and Affiliation	1				-.152*	.460**	.205**		.213**									
Information		1																
Political Discussion			1		-.153**		.207**	.151**	-.123*									
Convenience				1								.209**						
Blogger Identity					1			.162**		.122*	-.117*							
Comment						1					-.130*	.180**						
Promote						-.247**	1	-.223**	.157**	.151**	.119*	.146*						.144*
Follow Conversation						-.210**		1	.207**	.218**		.142*						
BSE Browsing									1		-.140*	.231**	.123*					
Link Browsing										1		.178**						
Searching										-.136*	1	.233**						
Remembering												1						
Subscribing													1		.342**			.167**
Hours/week														1	.354**	.326**		.150**
Blogs/day														.218**	1	.442**		
#Check/week																1		
IO number																		1
IO length																	1	.586**
Internet Experience					-.126*	.118*												
Blog Experience	.155**																	
Age	.150**						-.185**	-.178**		.133*	.159**							
Education																		
Income															.141*			

Legend

>.299	(yellow)
>.199	(green)
>0	(blue)
<0	(red)
*	p < .05
**	p < .01
Bold:	unique to factors

Figure 11: Partial correlation analysis of factor scores

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		Cmt	Sh	FC
A1	Rate the post I'm reading		.196**	
A2	Participate in polls	.131*	.175**	
A5	Look through the blog's archives			.114*
A6	Follow a link from the blogroll			.137*
A7	Follow the bloggers' links from a blog post	.139*	.140*	.192**
A10	Click on ads in blogs			.122*
A11	Further investigate and/or buy a product that a blogger has discussed/reviewed			
A12	Search for content within the blog			.140*
A13	Read comments	.340**		
A16	Leave a trackback link to my own blog	.319**	.176**	.221**
A17	Just read.	-.224**		
	Comment	1	.176**	
	Share	.176**	1	
	Follow Conversations			1

Figure 12: Correlations between the audience activity scales and the rest of the audience activity questions

		Cmt	Sh	FC
A1	Rate the post I'm reading	.113*	.215**	.120*
A2	Participate in polls	.145**	.184**	.108*
A5	Look through the blog's archives			
A6	Follow a link from the blogroll		.115*	.148**
A7	Follow the bloggers' links from a blog post	.190**	.208**	.239**
A10	Click on ads in blogs			.134*
A11	Further investigate and/or buy a product that a blogger has discussed/reviewed			
A12	Search for content within the blog			.162**
A13	Read comments	.329**		.139*
A16	Leave a trackback link to my own blog	.398**	.291**	.306**
A17	Just read.	-.212**		
	Comment	1		
	Share	-.276**	1	
	Follow Conversations	-.305**	-.321**	1

Figure 13: Correlations between the audience activity factors and the rest of the audience activity questions

Appendix V: Coded data from answers to "Please suggest some ways your blog reading experience could be improved."

Comments
• Monitored/ Moderated: Improve quality; Get rid of hate speech
• Better structure: Threaded (tree-structured) comments, which displays conversation between commenters
Blog aesthetics
• Less ads; (+7)
• Cleaner, simpler designs/ layout (+5); Better formatting – fewer colours; More legible typeface (+3)
• Concision (+4); short paragraphs
• Flash (software) disrupts flow; "Easier methods of changing how a page displays"
Navigation within blogs
• Abstracts for long posts; summaries (+2);
• Archives: be able to see all post titles at once; be able to read in chronological order; no dead URLs
• Tagging: Headings should be better; synonyms need to work
• Searching within blog: highlighting key words as Google does (+2); More accessible (+2)
Navigation within the blogosphere
• Interface: "A visual representation of the relevant blogs in a part of the blogosphere. So, if I know one blog I see roughly how and how closely other blogs are related."; "An easy, structured way to follow inter-blog discussions/arguments"
• Blog Search Engines: Better organization of results; better filtering (e.g. relevance, filter out duplicate posts);
• Recommender Systems: Better writing/ editing (+4), suggestions of similar blogs that the reader will like (e.g. RSSaid).
• Credibility (+4): "Less junk from non-experts", More fact, less opinion (+1); Sources and citations; "Acknowledge dissenting viewpoints and address them." "more accountability for writers" (+1)
RSS-related
• Full post in feed (+11) (as opposed to click-through) (or at least good abstracts)
• Comments in RSS feeds (+4) (+notification of newly added comments)
• More functionality: filtering, organizing feeds, "to read later list"
• Recommender System: See similar blogs, sites, based on feeds / rated by other blog readers
Miscellaneous

- Better compatibility with mobile devices (+8) (difficult to "page through posts" and to know which posts have been read)
- Ways to reduce blog reading (e.g., it is too easy to click on the next link in Metafilter) (+3)
- Convergence - Blogs could be more imbedded in existing media; "better connection with social media"
- Some blogs post too often, and some too infrequently
- "A way to block page takeovers."
- Some images etc. may take too long to load (+4)
- Show more posts on the main page, with longer posts expandable / collapsible.

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