Social Search Using a Social Q&A Service: Seeking Information and Assessing Credibility

by

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Dedication

To my loving father and mother,
Hyunsoo Jeon and Seunghee Kim

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Abstract

The development of various social technologies has provided people with abundant opportunities to interact with others in the process of information seeking. Researchers have begun to examine such interactions specifically in the context of online information seeking using a framework of *social search*. However, attention has mostly focused on interactions people have with existing contacts and acquaintances, rather than with unknown people. In addition, despite increased use of social question-answering (Q&A) services to seek information, prior research has focused more on those who answer questions than those who pose them. Finally, we know relatively little about how people assess the credibility of respondents or the information they provide during such online interactions. To address these gaps, this study uses a social search framework to examine people's information-seeking behavior and credibility assessment practices when asking questions in a social Q&A setting, with emphasis on interactions with a large number of unknown people.

In the study, 78 participants were instructed to use Yahoo! Answers, the largest and most popular social Q&A service, for one week by posting questions of their own choosing while in their natural settings. A total of 406 questions was posted by participants, and interviews regarding these questions and answers they received were conducted at the end of the week. The in-person post-use interviews captured individual's *in situ* experiences. Content analysis of interview data revealed that interacting with a large number of unknown people enabled information seekers to obtain personalized information that was tailored to their needs. At the same time, such interactions also facilitated more serendipitous discovery of information, thanks to human curation enabled by Yahoo! Answers. The study found that people used Yahoo! Answers not only as a platform to post questions, but also as a search system to access a collection of questions and answers accumulated over time. In doing so, they sometimes searched for fun, not necessarily aiming to find answers to their questions. This study also identified

characteristics of credibility assessment such as relativeness, crowd-assistededness, and transientness. Traditional constructs of credibility such as expertise and trustworthiness were examined, as well as two additional credibility constructs of pertinence and validity. These findings shed light on the positive effect of social interactions in social Q&A settings, and have implications for those studying information-seeking behavior and credibility assessment, as well as those seeking to improve the design of social Q&A services.

Chapter 1

Introduction

1.1 Background

The advancement of social tools and services enables people not only to easily reach a distributed large group of people to gather information, advice, and expertise in the context of their daily lives (Mamykina, Manoim, Mittal, Hripcsak, & Hartmann, 2011) but also to engage in social interactions, enhancing their experience with Web-based information seeking (Evans & Chi, 2010). This process of finding information online through social interactions has been recently characterized and discussed as *social search* (e.g., Evans & Chi, 2010; Morris, Teevan, & Panovich, 2010b).

1.1.1 Social Search

There exist two approaches to looking at social search: (1) from *the information behavior perspective* and (2) from *the system perspective*. Researchers have been using the term "social search" to describe various information-seeking activities. Social search includes a range of activities such as asking questions of others using online services (Chi, 2009; Mao, Shen, & Sun, 2013; Morris, Teevan, & Panovich, 2010a; Morris et al., 2010b), looking for information using search engines that utilize social feedback or data mining of social media streams (Chi, 2009; Evans & Chi, 2008; Mao et al., 2013; Morris et al., 2010a), or searching socially generated content such as tweets (Evans & Chi, 2010; Morris et al., 2010a, 2010b; Teevan, Ramage, & Morris, 2011). However, some researchers have proposed to use the term to describe any information retrieval (IR) system that depends on the user's social context in order to improve the search process, viewing social search systems as one of many social software tools (Burghardt, Heckner, & Wolff, 2012).

In this study, I take an information behavior perspective in my approach to social search and define it broadly in an attempt to include a range of possible social interactions that may facilitate information-seeking tasks (Evans & Chi, 2008). I define social search as one's process of finding needed information online by utilizing distributed social resources through interactions enabled by online social technologies. Specifically, social search involves the following four elements: (1) a process of information seeking, (2) assistance of others, (3) interactions with a large number of people, and (4) use of online social technologies.

Among various types of social search, this study focuses on social search that mainly involves explicit interactions with other people: asking questions of other people using online social tools or services to seek information. Various strategies can be employed in order to ask questions of others, depending on whether one identifies a specific person to ask for help one-on-one or posts a question in a public venue, how close the person (or people) to whom one turns for help is to the one who asks a question, and whether interactions between an asker and answerer(s) are synchronous or asynchronous (Evans & Chi, 2010; Nichols & Kang, 2012). Those who answer one's question could come from various levels of social proximity, ranging from close friends and acquaintances, to friends of friends of friends, to a distributed public, depending on what social tools one chooses to use for seeking help (Chi, 2009).

Social question-answering (Q&A) services can be considered venues for social search in that they enable people to reach a distributed large group of unknown people online in the process of information seeking. Social Q&A services are community-based services that allow people to ask questions and receive answers from their fellow users on a broad range of topics (Kim, Oh, & Oh, 2007; Kitzie & Shah, 2011; Oh, Oh, & Shah, 2008; Shah & Kitzie, 2012).

Social Q&A services usually provide features that support browsing and searching a collection of past questions and answers in addition to current question asking and answering. Most social Q&A sites provide a feature that allows either a question asker or general users to select the best answer among posted answers. People can also comment on answers and evaluate the quality of answers as well as questions by giving ratings or stars. Examples of social Q&A services include Yahoo! Answers

(http://answers.yahoo.com/), Answerbag (http://www.answerbag.com), and Naver Knowledge-IN (http://kin.naver.com/), a Korean social Q&A service.

1.1.2 Question Asking on Social Q&A Services

Research on social Q&A services has largely focused on their nature as user-generated content sites or online communities rather than as venues for social search. Most studies on social Q&A sites have examined user behavior at an aggregate level by analyzing large datasets such as transaction logs or question-answer pairs (Adamic, Zhang, Bakshy, & Ackerman, 2008; Harper, Moy, & Konstan, 2009; Nam, Ackerman, & Adamic, 2009; Shah, Oh, & Oh, 2008). Such aggregate-level analysis has identified the distribution of users in terms of their roles as either askers or answerers and users' patterns of behavior in terms of question type, thread length, and number of answers received (Adamic et al, 2008; Nam et al., 2009).

On social Q&A sites, people ask many types of questions, including factual, advice-seeking, discussion-oriented, opinion-oriented, procedural, or task-oriented questions, across a number of topical categories (Adamic et al., 2008; Harper et al., 2009; Nam et al., 2009). In general, it appears that little overlap exists between those who ask questions on social Q&A sites and those who answer them, although some overlap is observed in topical categories that mostly attract non-factual questions (Adamic et al., 2008; Nam et al., 2009; Shah et al., 2008).

Responsiveness and diversity of answers resulting from the large community of users have been identified as two main reasons that people use social Q&A services to seek information (Harper, Raban, Rafaeli, & Konstan, 2008; Kim, 2010). Another reason that people turn to social Q&A services to satisfy their information needs is that they can receive personalized answers to their questions (Kim, 2010; Shah et al., 2008). As the contributions of answerers play a critical role in maintaining social Q&A services, numerous studies have investigated why people voluntarily answer questions on social Q&A sites. It appears that both intrinsic and extrinsic motivation play a role in encouraging people to answer questions (Nam et al., 2009; Oh, 2011, 2012; Raban & Harper, 2008). One's decision to answer questions is also influenced by one's first experience with a social Q&A service (Yang, Wei, Ackerman, & Adamic, 2010).

As people are increasingly using online social tools such as social Q&A services as sources of information, it is important to understand how they evaluate information they obtain in these contexts. Studies on Web credibility generally have found that people find it difficult to judge the value and credibility of information based on author, content, and source on the Web due to a lack of quality control mechanisms and a limited number of available cues (Metzger, 2007; Rieh, 2002). A number of studies have also found that few users rigorously assess the quality of the information they obtain via the Internet, and that those who do usually use a minimal number of criteria, such as website design and navigability (Flanagin & Metzger, 2000; Metzger, 2007).

In social Q&A settings, where people interact with online content created by other users and interact with unknown people, individuals may encounter different challenges in evaluating obtained information. Studies have reported that people pick up affective cues such as attitude or tone, which are embedded in questions and answers, when assessing the credibility of information (Kim, 2010; Kim & Oh, 2009). Furthermore, any cues may be helpful for developing trust in online settings where there is no strong community or where users often lack long-term engagement, as is the case with social Q&A sites (Golbeck & Fleischmann, 2010).

1.2 Problem Statement

Information seeking on the Web that involves a single person's information needs has been traditionally discussed and studied as a solitary activity, and little attention has been given to social aspects of Web search behavior until recently. There has been substantial growth of social technologies including social Q&A services that enable interactions with other people in the process of information seeking. Researchers have begun to examine these social interactions that take place in the process of information seeking online using the framework of social search, but attention has mostly focused on interactions with people one knows, such as friends in one's social network (e.g., Morris et al., 2010a, 2010b). While social Q&A services serve as venues that enable social interactions at a massive scale in the process of information seeking, most studies have not paid sufficient attention to interactions that take place in social Q&A settings. Therefore, there is a need for research that focuses on interactions with people one does not know in order to get a fuller picture of social aspects of Web search behavior. This

study focuses on social aspects of Web search behavior by investigating how people use social Q&A services as venues for social search. In doing so, it looks at the use of social Q&A services as part of a "search ecology" in everyday contexts as people are given multiple sources they can turn to when they need to find information in today's online environments.

Social Q&A services have been examined primarily as online communities that produce user-generated content. Prior research on these services has examined mostly those who make contributions to such communities by answering questions, in an attempt to understand the behavior and motivations of answerers, rather than examining those who ask them (Dearman & Truong, 2010; Nam et al., 2009; Oh, 2011, 2012). Few researchers have recognized that information seekers also play a significant role as content creators by asking questions in social Q&A settings, initiating the social interactions in the first place. As a result, little work has looked at how individuals who seek information interact with a large group of unknown people in the process of information seeking in social Q&A settings. The fact that people are increasingly using social Q&A services to seek information necessitates research on social Q&A services from the information seeker's perspective. Therefore, I seek to address the gap in the current literature on social Q&A services by focusing on those who ask questions, examining how individuals engage in interactions with a large group of unknown people when they seek information in social Q&A settings.

Asking questions on social Q&A sites and asking questions on social network sites (SNSs) share common characteristics in that both allow people to use distributed human mediation to seek information and thus enable them to obtain more subjective and personalized information. However, they differ in that those who answer questions on social Q&A sites are usually strangers or almost strangers, while those who answer questions on SNSs usually know the askers. As individuals interact with people they do not know and with online content created by those unknown people in social Q&A settings, they may encounter different challenges in judging the credibility of information. For example, when evaluating information on social Q&A sites, do people distinguish between the sources of information (i.e., answerers) and the content of

answers? Do they become more dependent on new types of social cues in the process of finding credible answers?

Prior work has addressed issues surrounding credibility assessment in social Q&A settings, such as the identification of criteria used to evaluate answers and the effect of particular cues on trust in the answerer (Golbeck & Fleischmann, 2010; Kim, 2010; Kim & Oh, 2009). However, we still know relatively little about how people make credibility judgments when interacting with a crowd of unknown people in this online environment. I aim to investigate in what ways credibility assessment differs in the social Q&A setting where people interact with a large group of unknown people to seek information, given our current understanding of online credibility assessment. From a search ecology perspective, evaluating the quality of obtained information plays an important role in determining whether one accepts information and stops searching or whether one continues searching by performing a new search. Among various aspects of information quality, I focus on credibility because this is the most effective attribute of information quality characterizing people's information evaluation behavior in the context of interacting with unknown people.

1.3 Objectives and Research Questions

The overarching goal of this study is to examine how people use a social Q&A service as a venue for social search in an attempt to better understand social aspects of Web search behavior. It investigates people's social search behavior and credibility assessment practices in a social Q&A setting, with emphasis on interactions with a large number of unknown people.

Specifics objectives of this study include:

1. To understand how people perceive a social Q&A service as an information source and use a social Q&A service in the process of seeking information in general;
2. To examine specific social search practices in a social Q&A setting, identifying social search goals, expectations, question-formulation strategies, and outcomes of social search;
3. To investigate how people conceptualize credibility and assess credibility in a social Q&A setting, with an emphasis on the social aspects of this process.

The specific research questions driving this study are:

1. What are people's general perceptions of a social Q&A service in terms of characteristics, benefits, and costs, and what are the overall characteristics of their use of a social Q&A service?
2. What are people's specific social search practices when posting questions to a social Q&A service in terms of goals, expectations, question formulation, and outcomes?
3. How do people conceptualize and assess credibility in the process of social search when using a social Q&A service?

1.4 Research Design

To address this study's research questions, in-depth data that could explain why and how people behave in particular ways when seeking and evaluating information in a social Q&A setting needed to be drawn from individuals' first-hand experiences in the context of their daily lives. Therefore, for the purposes of this research, participants were instructed to use a social Q&A service for one week by posting their own questions to the site in their natural settings. The study involved three steps: (1) an introductory meeting; (2) one week's use of a social Q&A service; and (3) an in-person post-use interview. It entailed a combination of various qualitative and quantitative data collection methods, including interviews, administration of background questionnaires and post-interview questionnaires, and recordings of on-screen activities to capture data about questions submitted by participants and answers they received.

To address the potential variance in the participants' activity level while permitting the collection of data drawn from participants' experiences in situ, a combination of controlled and uncontrolled approaches was used. By instructing them to post a certain number of questions for a certain period time, the consistency in the level of participants' activity during the study period was ensured. The collection of data drawn from participants' experiences in natural settings was made possible by letting participants post questions on any topic they were interested in at their convenience instead of requiring them to post questions provided by the researcher.

Moreover, in-person semi-structured interviews based on questions posted by participants and answers they received were used as the primary means of data collection

in order to gather nuanced, in-depth data about their information seeking and credibility assessment behavior in a social Q&A setting directly from those who asked the questions. I chose to conduct an interview following one-week's use of a social Q&A service with relatively short delay. This allowed me not only to obtain data on participants' experience which was as accurate as possible by restricting the recall task to a short and recent reference period, but also to reduce bias associated with retrospection (Schwarz, 2007).

1.5 Significance

Social Q&A services have become increasingly popular as they enable people to obtain personalized answers to their questions from a large number of other people quickly (Harper et al., 2008; Shah et al., 2008). There is, at the same time, a growing need to filter information, as people are often overwhelmed when given too much information.

By asking questions of a crowd of unknown people using social Q&A services, people engage in a form of search that uses distributed social resources and the interactions enabled by social technologies to find needed information. Such social searching helps people to obtain information that is more contextualized, personalized, and filtered through distributed human mediation.

In today's online environments, people have a number of choices of sources to which they can turn for information. They are likely to take advantage of multiple sources of information in order to achieve more effective results. For example, people may use both social Q&A services and traditional Web search engines in a single search episode. This indicates the need to investigate people's social search behavior in social Q&A settings as a part of "search ecology."

This study expands the understanding of information seeking as a non-solitary activity in that it provides insights into how social interactions influence the process of information seeking in a social Q&A setting. The study reveals that through such social searches, people not only obtain personalized information, but also enjoy opportunities for serendipitous information discovery. The study thus expands our view of social Q&A services by revealing the versatile ways in which people use them. The findings also illuminate the effect of social interactions with a crowd of unknown people on online

credibility assessment, by identifying distinctive characteristics of credibility assessment and new credibility constructs in a social Q&A setting.

1.6 Structure of the Dissertation

This dissertation consists of six chapters. Chapter 2 provides a review of the relevant literature. Chapter 3 outlines the research methods that were used in conducting the study. Chapter 4 details the results. Chapter 5 discusses the findings and then describes the limitations. Chapter 6 presents the implications and contributions of this study, provides several ideas for future research in this area, and closes with some concluding remarks.

Chapter 2

Literature Review

This literature review covers two areas—social search and credibility judgment on the Web—as this study investigates how people utilize social technologies in the process of online information seeking and online information evaluation in social question-answering (Q&A) contexts. In the first section, social search is discussed as a framework that is employed to understand people's information seeking when powered by social technologies. In addition, a brief discussion of environments where question asking and answering in a broader sense takes place is provided. Then, social Q&A services are discussed in detail as settings in which one particular type of social search (i.e., asking questions of others using various social tools and services) takes place. The second section examines how people evaluate information on the Web, focusing on credibility assessment.

2.1 Social Search

Online social tools and services enable people to easily reach a large number of other people to gather information, advice, and expertise in the context of their daily lives (Mamykina et al., 2011). Moreover, various social inputs generated by these tools and services are increasingly providing individuals with opportunities to enhance their experience with seeking information on the Web (Evans & Chi, 2008, 2010). Recently, this process of finding information online through social interactions has been characterized and discussed as social search. In this section, I describe what social search encompasses, and a variety of computer-mediated communication (CMC) settings where question asking and answering takes place is briefly discussed to clarify the scope of social Q&A services relevant to this study. Then, a detailed discussion of one particular type of social search, asking questions using social Q&A services, follows.

2.1.1 What is Social Search?

Researchers have been using the term “social search” to describe various information seeking activities, proposing different definitions of social search based on either a behavior perspective or a system perspective.

Evans and Chi (2008, 2010) broadly defined social search as search acts that utilize social interactions with others by acknowledging a wide range of search activities that can be considered social search, such as use of social and expertise networks, search taking place in shared social workspaces, or search involving social data-mining or collective intelligence processes. Some scholars have emphasized the information-seeking process and assistance from others that takes place during this process in defining social search. They have suggested that social search refers broadly to the process of finding information online with the assistance of social resources (Efron & Winget, 2010; Morris et al., 2010b). In a similar vein, McDonnell and Shiri (2011) provided a narrow definition of social search, defining it as use of social media to aid information seeking on the Web.

In contrast, several researchers have used the term “social search" to describe search systems. Chi (2009) suggested that social search systems are systems that engage social interactions or utilize information from social sources such as logs, votes, or tags. Based on this definition, he classified social search systems into two types: social answering systems and social feedback systems. Examples of social answering systems include social Q&A services and SNSs, while examples of social feedback systems include search engines and recommender systems that utilize social information (Chi, 2009; Trias i Mansilla & de la Rosa i Esteva, 2013).

Burghardt, Heckner, and Wolff (2011) used the term “social search” to refer to any information retrieval system that utilizes the user’s social context in order to improve the search process, viewing social search systems as one type of social software that supports people’s communication and collaboration. They suggested that collaboration in the context of social search can be either implicit or explicit, and that explicit collaborations can take various forms such as social tagging, social question answering, collaborative search, collaborative filtering, and personalized social search engines.

As social search includes a wide range of information activities, it is difficult to reach consensus about a single precise definition of social search. However, several defining characteristics of social search have been identified based on a review of prior work. Social search involves the following four elements: (1) a process of information seeking, (2) assistance from others, (3) interactions with a large number of people, and (4) use of online social technologies.

In this study, I take an information behavior perspective in my approach to social search. In addition, social search is defined broadly in order to include a range of possible social interactions that may facilitate information-seeking and sense-making tasks (Evans & Chi, 2008). Specifically, I define social search as one's process of finding information online to satisfy one's information needs by utilizing distributed social resources through interactions that are enabled by online social technologies.

It is noted that, in this study, I look at social search in the context of information seeking that involves a single individual's need, distinguishing social search from collaborative search that involves a shared information need. Collaborative search refers to the process of more than one person searching together with a shared goal (Morris & Teevan, 2009). While some scholars consider collaborative search part of social search (Burghardt et al., 2011; Morris & Teevan, 2009), I decided to distinguish social search from collaborative search as there exist different dynamics in the context of collaborative search, such as division of labor (Pickens, 2011). Therefore, social search in this study involves information seeking tasks in which the information need is a single individual's need, not a shared one, and this individual is willing and able to utilize social resources to seek assistance in order to satisfy that need (Pickens, 2011). Social resources can be diverse, ranging from a social network of friends and associates to a large group of unknown people (Morris et al., 2010b; Panovich, Miller, & Karger, 2012). Social search is network and community augmented, but ultimately satisfies a solitary need (Pickens, 2011).

Various dimensions in relation to social search and collaboration for online information seeking have been identified, including intent (explicit vs. implicit), concurrency (synchronous vs. asynchronous), location (co-located vs. distributed), and

depth (UI-only mediation vs. algorithmic mediation) (Evans & Chi, 2008; Golovchinsky, Pickens, & Back, 2008; McDonnell & Shiri, 2011).

In providing a broad definition of social search, Evans and Chi (2008) suggested that interactions with social resources in the process of social search may be explicit or implicit, co-located or remote, synchronous or asynchronous. Similarly, McDonnell and Shiri (2011) proposed several dimensions with respect to collaboration that can be used to categorize social search. They stated that collaboration in the context of social search can be either synchronous or asynchronous, depending on whether users interact in real time, and can be either implicit or explicit, depending on whether collaboration involves mere exploitation of data created by other collaborative processes (e.g., use of other's interaction histories to personalize search results for an individual).

In a broader sense, Golovchinsky et al. (2008) proposed a taxonomy of collaborative information seeking on the Web, introducing four dimensions of collaboration: intent, depth, concurrency, and location. Intent can be either implicit or explicit, depending on whether people simply benefit from data obtained from other users in the process of information seeking or whether they engage in collaborative search to meet a shared information need. Depth of mediation refers to whether mediation of information seeking occurs at the user interface level or at the algorithm level, which is a deeper form of mediation. Concurrency represents whether one's action influences other people synchronously or asynchronously. Location refers to whether collaboration is co-located or distributed.

Among these various dimensions, I focus on the dimension of intent, as social search is viewed from the information behavior perspective in this study. Social search is classified into the following two types, depending on the intent behind interactions with social resources: (1) social search that involves explicit interactions with social resources and (2) social search that involves implicit interactions with social resources (i.e., use of information provided by other people).

Explicit interactions in the process of social search commonly take place in the form of asking questions of other people using various social tools and services on the Web, including social Q&A services such as Yahoo! Answers, social network sites (SNSs) such as Facebook and Twitter, or social search engines such as Aardvark.

Depending on the social tools or services used, answers can come from people at various levels of social proximity, ranging from friends, coworkers, and experts to unknown people (Chi, 2009).

Implicit interactions mostly take the form of Web search enhancement by using various types of social inputs (Chi, 2009; Evans & Chi, 2008; Morris et al., 2010a, 2010b). For example, this type of social search includes information seeking using search engines that utilize social feedback (e.g., others' activity logs, social votes, social tags, and social bookmarks) or data mining of social media streams (e.g., Facebook status updates or Twitter tweets) to improve search processes and rankings. Implicit interactions also may involve searching an existing collection of social media streams or an archive of questions and answers of social Q&A services such as Yahoo! Answers.

Despite the lack of a standardized and generally accepted definition, it is generally agreed that social search involves the use of social resources and a large number of human mediators to find information online. In the remaining part of this section, I will discuss in detail one particular type of social search that involves explicit interactions with other people, focusing on social Q&A services where people interact with a crowd of unknown people.

2.1.2 What is a Social Q&A Service?

To outline the scope of social Q&A services for this study, a brief discussion of various CMC environments that afford question asking and answering is first provided and definition of social Q&A services is discussed.

2.1.2.1 Question Asking and Answering in CMC Environments

Since the early days of the Web, a variety of CMC environments have enabled people to seek help and information in their everyday settings. Some have been specifically designed to support people seeking help and information through question asking, while others have served as venues for this purpose despite having different primary purposes. Researchers have examined people's help and information seeking behaviors within these various environments including chat-like systems, online communities such as Usenet forums or discussion forums, social network sites, and social search engines (e.g., Ackerman, Dachtera, Pipek, & Wulf, 2013; Gazan, 2011).

Ackerman and Palen (1996) studied the Zephyr Help Instance at MIT, a chat-like system that allows users to ask questions and other users to answer. Through the qualitative examination of a publicly available message log and interviews of system users, they observed behavioral patterns in relation to question asking and answering. For example, those who asked a question may have received no answer or multiple answers from several people, and they could ask for additional help if they did not understand the answers they received. The authors also identified reasons for continued use of this system over time, including a common enough understanding of the space's purpose, a shared understanding of its key roles, and positive adaptation to the organizational culture. Based on these findings, they argued that the continued use of such a system over time can be achieved when the system's features support users' behavior patterns and at the same time users' behavior patterns are developed through interactions among users, context and the system.

Other online environments that researchers have investigated as venues for seeking help and information are online communities such as Usenet forums, technical support forums, or general discussion forums (Fiore, Tiernan, & Smith, 2002; Savolainen, 2001, 2011; Zhang, Ackerman, & Adamic, 2007). It is generally agreed that an online community is a social space where people communicate and interact around shared interests through computer-based information technologies (Bagozzi & Dholakia, 2002; Lee, Vogel, & Limayem, 2003; Plant, 2004; Porter, 2004). The participation of community members through communication and interaction generates the content of the online community, and such communication and interaction are guided by established cultural norms (Bagozzi & Dholakia, 2002; Lee et al., 2003; Porter, 2004).

Researchers have developed a number of typologies of online communities based on various aspects such as the purpose they serve and the way they are created. For example, Hagel and Armstrong (1997) categorized online communities into four types based on basic human needs: interest, relationship, fantasy, and transaction. Interest-oriented communities refer to communities formed around shared interests and expertise in a particular topic. Relationship-oriented communities refer to communities that allow people with similar experiences to develop meaningful personal relationships. Fantasy-oriented communities refer to communities that enable people to explore fantasy and

entertainment together. Transaction-oriented communities refer to communities formed to allow participants to trade information easily. Jones and Rafaeli (2000) extended Hagel and Armstrong's classification scheme by introducing two additional aspects. Their classification system is based on three dimensions: use, social structure, and technology. In their scheme, use refers to the human needs described in Hagel and Armstrong's classification system. Classification by social structure is based on analysis of the social network formed by community members, and classification by technology is based on the type of technologies used in the online community. Porter (2004) proposed a simple typology of online communities based on two dimensions, establishment and relationship orientation, in an effort to develop a scheme that could apply across disciplines. Establishment refers to whether a community is established by members or organizations, while relationship orientation refers to the types of relationships fostered among members of the community. More specifically, member-initiated communities foster either social or professional relationships among members, while organization-sponsored communities foster relationships both among members and between individual members and the sponsoring organization.

Given the important role that the shift of focus from physical proximity to the nature of relationships plays in extending the concept of community to online environments (Preece & Maloney-Krichmar, 2003; Wellman & Gulia, 1999), it is not surprising that a large number of studies of online communities have focused on online relationships, investigating questions such as how relationships develop online, what online relationships look like, and how online relationships affect offline relationships (Ellis, Oldridge, & Vasconcelos, 2004). A common theme many researchers have identified is that online communities are simply another place for people to meet and interact with others (Carter, 2005; Parks & Floyd, 1996; Wellman & Gulia, 1999).

While relationship-building interactions play an important role in online communities, online communities support another function of information-oriented interactions as well. As Burnett (2000) suggested, online communities provide both interpersonal and informational interactions. Interpersonal interactions refer to interactions that are intended to build relationships and socialize, such as exchanges of emotional support, while informational interactions refer to activities related to

information, such as information seeking, information provision, and information sharing (Burnett, 2000). For example, Savolainen (2001) examined the role of Usenet newsgroups as an information source in non-work contexts by studying one Finnish newsgroup using the Usenet bulletin board system, called "The Consumer Group." Analysis of messages posted to the newsgroup revealed that some threads addressed people's information needs, providing useful advice, while there also existed many threads that involved unfocused chatting and that were not intended for information seeking. In addition, he found that few information seekers appeared to offer feedback on responses they received, although this space was used as a venue for information seeking. In a study that investigated an online help-seeking community, the Java Forum, through social network analysis, Zhang (2008) identified several unique characteristics of this forum in relation to question asking and answering. Specifically, they found that in this online community, unlike the rest of the Web, a smaller percentage of people actively asked and answered questions each other, and the majority of the users tended to ask questions only. In addition, a very small number of users answered a large number of questions, and those who provided many answers tended to answer questions for everyone, whereas those who had less expertise tended to answer questions from users with lower expertise levels. The role of discussion forums as a place for information seeking was also examined in another study by Savolainen (2011). By analyzing postings and messages collected from ten blogs and one discussion forum focused on depression, he discovered that most people sought others' opinion or evaluation of an issue rather than factual information or procedural information, and those who provided responses to the request tended to base it on their personal knowledge or own experience instead of spending much time and energy to find additional information beyond their knowledge.

Although the primary intent of people using SNSs such as Facebook and Twitter is to communicate with people who are already part of their extended social network (boyd & Ellison, 2007), people are increasingly using these sites as sources to seek information. Recently, a number of studies have examined how people use various SNSs to ask questions of their friends and seek information through such settings as Facebook (e.g., Ellison, Gray, Vitak, Lampe, & Fiore, 2013; Lampe, Vitak, Gray, & Ellison, 2012; Morris et al., 2010b; Panovich et al., 2012; Yang, Morris, Teevan, Adamic, & Ackerman,

2011), Twitter (e.g., Efron & Winget, 2010; Jeong, Morris, Teevan, & Liebling, 2013; Liu & Jansen, 2012; Nichols & Kang, 2012; Paul, Hong, & Chi, 2011), and Sina Weibo (e.g., Liu & Jansen, 2013a, 2013b; Zhang, 2012).

It appears that people turn to their social networks to find answers to questions on a variety of topics, including opinions and recommendations (Efron & Winget, 2010; Liu & Jansen, 2012; Morris et al., 2010b; Zhang, 2012). Prior work also has found that a number of factors motivate this behavior. According to Morris et al. (2010b), people ask questions on SNSs because they trust the opinions of people they know rather than the opinions of strangers. Moreover, people find it easier to ask questions in natural language, and they appreciate that their background and preferences are already known by their friends, who are thus able to provide tailored answers (Morris et al., 2010b). People identify this process as having both primary benefits such as trustworthy and personalized answers, and secondary benefits such as social awareness and fun.

With regard to information evaluation in the context of SNSs, people tend to trust information from people in their social networks because they know them (Horowitz & Kamvar, 2010; Morris et al., 2010b). When people evaluate information they receive from others in their social networks, the degree of closeness between questioner and respondent seems to have a large impact on trust assessment. Regardless of whether a question is broadcast in general or targeted toward someone specific, this importance of social proximity in evaluating information when using SNSs has been confirmed by a number of studies (Horowitz & Kamvar, 2012; Panovich et al., 2012; Paul et al., 2011).

2.1.2.2 Definition of a Social Q&A Service

Question asking and answering (Q&A) services provide online venues that are specifically designed to allow people to ask and respond to questions on a broad range of topics (Harper et al., 2008). These services can be classified into three types: digital reference service, expert service, and social Q&A service (Harper et al., 2008; Shah, Oh, & Oh, 2009).

Digital reference services are an extension of traditional library reference services. Answerers are reference librarians who are trained information professionals, and question asking and answering takes place in the form of one-to-one interactions between a reference librarian and a user (Harper et al., 2008; Shah et al., 2009). Examples

of digital reference services are the Library of Congress's "Ask a Librarian" (http://www.loc.gov/rr/askalib/) and the New York Public Library's "Ask Librarians Online" (http://www.nypl.org/questions/).

Expert services are defined as non-library information services in which self-declared "experts" answer user questions on the Web in a number of subject areas, for free or for a fee (Janes, Hill, & Rolfe, 2001; Shah et al., 2009). They tend to have some procedural structure in terms of how questions are assigned to experts (Harper et al., 2008). For example, questions may be assigned to experts depending on the category of the question asked, or questions may be claimed by experts who are willing to answer them. An example is AllExperts (http://www.allexperts.com).

Social Q&A services are community-based services that allow people to ask questions and receive answers from their fellow users on a broad range of topics (Kim et al., 2007; Kitzie & Shah, 2011; Oh et al., 2008; Shah & Kitzie, 2012). There are other types of social Q&A services, including domain-specific social Q&A services such as Stack Overflow, which deals with programming-related questions (Anderson, Huttenlocher, Kleinberg, & Leskovec, 2012; Asaduzzaman, Mashiyat, Roy, & Schneider, 2013; Mamykina et al., 2011), real identity-based social Q&A services such as Quora (Paul, Hong, & Chi, 2012; Wang, Gill, Mohanlal, Zheng, & Zhao, 2013), and payment-based services such as Google Answers, Uclue, and ChaCha (Mao et al., 2013). However, in this study, by social Q&A services, I refer to free Q&A services that are community-based, general-purpose, and anonymous.

Social Q&A services usually provide features that support browsing and searching questions and answers in addition to question asking and answering. Most social Q&A sites provide a feature that allows either a question asker or general users to select the best answer among posted answers. People can also comment on answers and evaluate the quality of answers as well as questions by giving ratings, casting votes, or awarding stars. Examples of social Q&A services include Yahoo! Answers (http://answers.yahoo.com/), Answerbag (http://www.answerbag.com), and Naver Knowledge-IN (http://kin.naver.com/), a Korean social Q&A service.

These online Q&A services share several characteristics. First, all involve "the use of human intermediation to answer questions in a digital environment" (Lankes,

2004, p. 301). Second, they allow users to express their information needs as questions using natural language as opposed to keyword-based queries in Web search engines (Shah et al., 2008, 2009). Third, people can receive highly personalized answers to their questions, something which may not be possible with traditional Web search engines, as information contained in questions helps answerers put other people's information needs in context (Shah et al., 2008; Yang et al., 2011).

Despite the common characteristics mentioned above, there are a number of properties that distinguish social Q&A services from other online Q&A services. First, voluntary participation of general users is critical for success, as anyone can ask and answer questions on social Q&A sites (Shachaf, 2010). Second, throughout the entire process of question asking and answering, the products of this process—questions, answers, and comments—are publicly available (Shah et al., 2009). Third, people can collaborate by sharing and distributing information among fellow users, and thus a community can be built around such services (Shachaf, 2010; Shah et al., 2009) and social capital can be accumulated (Radford, Connaway, & Shah, 2012).

Social Q&A services allow people to find information by reaching social resources like SNSs do. Asking a question on social Q&A sites such as Yahoo! Answers and asking a question on SNSs such as Facebook share common characteristics in that both allow people to use distributed human mediation to seek information and thus enable people to obtain more subjective and personalized information. However, they differ with respect to those who answer questions. Participants on a social Q&A site are usually strangers or almost strangers, while those who answer questions on a SNS usually know the asker.

Morris et al. (2010b) discussed a number of differences between asking questions on social Q&A sites and SNSs. First, questions on social Q&A sites can be posted anonymously or under a pseudonym, whereas on a SNS, the asker's true identity is known to the readers of the question. Second, the number of potential answerers is much smaller on a SNS than on a social Q&A site. Finally, SNSs typically impose a much shorter character limit for a message, whereas many social Q&A sites have a much larger limit for questions and answers.

While using social Q&A services as sources of information has proved to provide a number of benefits, some scholars have pointed out potential disadvantages of social Q&A services, including uncertainty about the likelihood of getting answers, lack of guarantee of high quality answers, and the possible occurrence of informal and off-topic conversation (Burghardt et al., 2011; Dearman & Truong, 2010; Paul et al., 2012).

2.1.3 Information Behavior Within Social Q&A Services

As social Q&A services are increasingly used as means to seek information online, recent years have seen a growing interest in such services among scholars in various fields, including information behavior researchers and information retrieval researchers. This subsection reviews prior research related to social Q&A services with a focus on information behavior-based literature.

2.1.3.1 User Behavior Patterns Within Social Q&A Services

A number of studies have investigated users' behavior patterns at the aggregate level by analyzing large sets of activity data obtained from various social Q&A services, suggesting several common patterns. In general, it appears that little overlap exists between those who ask questions and those who answer questions on social Q&A services.

Nam et al.'s (2009) analysis of Naver Knowledge-iN's data revealed that only 5.4% of that site's users engaged in both asking and answering in the same category, showing that users were largely divided into askers and answers. Shah et al. (2008) found that users at higher levels on Yahoo! Answers seemed to be answering many questions, but not necessarily posing that many questions, while those at lower levels tended to be mostly asking questions. Similarly, Kang, Kim, Gloor, and Bock (2011) identified that at both Yahoo! Answers and Knowledge-iN, heavy users tended to answer questions, spending little time asking questions.

However, some overlap has been observed in topical categories that mostly attract non-factual questions. Adamic et al. (2008) found that technical categories such as Car Maintenance & Repair or Computers & Internet had a lower overlap in users who were both askers and answerers, while categories dealing with familiar topics such as Family & Relationships had the highest overlap between the two roles.

Compared to askers, answerers demonstrate much greater commitment to social Q&A communities by contributing more and staying longer. Shah et al. (2008) found that in Yahoo! Answers, users who had earned more points and thus were at higher levels exhibited more and better participation by answering more questions and receiving higher ratings on average than those at lower levels. Those who answered questions not only demonstrated greater participation but also showed greater retention than those who asked questions, as users who stayed longer prefer answering to asking (Yang et al., 2010).

In addition, as in many other online communities, use of social Q&A services follows a power-law distribution. Furtado, Andrade, Oliveira, and Brasileiro (2013) confirmed the power-law distribution of users in the context of social Q&A by analyzing data obtained from five sites that operated based on the Stack Exchange Q&A platform. Similarly, Welser, Gleave, Barash, Smith, and Meckes (2009) found that contributions to Live QnA follow a skewed distribution, with those at the top 1 % activity level posting over 70% and those at the top 10% activity level posting over 95 % of all posts.

While some may continue to use the site, among the total group of those who use social Q&A sites to address their information needs, some may ask a question and then never return to the site. Yang et al.'s (2010) study reported that a large proportion of people who ask a question on a social Q&A site tend to be one-time users, with 30% - 70% of users leaving after posting just once.

Research findings indicate that one's decision regarding whether to continue to use a social Q&A site after asking a question is influenced by one's experience with the site. Yang et al. (2010) examined users' participation lifespans across three social Q&A sites, Yahoo! Answers, Naver Knowledge-IN, and Baidu Knows, and found that first experiences mattered for user retention. According to Yang et al., question askers tended to stay longer if they could successfully obtain better, more numerous, and longer responses. Kim (2010) also found that previous positive experiences with Yahoo! Answers motivated users to use it as an information source again. Overall, it seems that a very small number of users continue to use social Q&A services, while most people are one-time users, and those who participate in communities usually do so intermittently (Furtado et al., 2013; Nam et al., 2009).

With regard to the behavioral patterns of those who answer questions, they tend to specialize in answering questions (Nam et al., 2009). However, this is not the case for those who specialize in providing technical answers (Welser et al., 2009). This may be partly attributed to the fact that the posting of opinion and discussion-type questions that may be considered trivial and non-serious predominates (Welser et al., 2009). Adamic et al.'s (2008) study confirmed this tendency towards less seriousness on Yahoo! Answers. They suggested that the questions on Yahoo! Answers are very shallow despite the broadness of its topics.

In addition, dedicated experts who contribute primarily technical and factual answers are rare, partly because they get crowded out by the high activity of less serious contributors (Welser et al., 2009). Furthermore, social Q&A sites seem to demonstrate relatively poor performance in answering technical questions that require domain expertise (Nam et al., 2009). Some users of Yahoo! Answers perceive that a social Q&A site is not a good place to ask serious or focused technical questions (Kim, 2010).

Users' behavioral patterns seem to be influenced by several factors, including cultural differences and topical categories. Researchers have reported differences in user behavior patterns in social Q&A services between the West and East. Kang et al. (2011) showed that on Yahoo! Answers, a U.S. social Q&A service, users answer any questions on which they have opinions, even though their answers might overlap with other answers or not provide unique contributions, while at Knowledge iN, a Korean social Q&A service, if questions are correctly answered once, other heavy users rarely post more answers to these questions. Yang et al. (2010) also found that there are more social conversations going on on Yahoo! Answers compared to other social Q&A services, and that Yahoo! Answers has significantly more answers per question on average. They argued that Yahoo! Answers users like to raise discussion topics to garner others' opinions or simply for fun, and they tend to add more humor, offer personal opinions, and express sociable statements on the answering side.

With respect to the effect of topical categories on user behavior patterns, Adamic et al.'s (2008) study showed that responses on Yahoo! Answers exhibit different characteristics and dynamics depending on topic categories. Based on an analysis of its activity data, the researchers classified categories on Yahoo! Answers into three topic

types: Factual, Advice, and Discussion. Each of the three types displays different characteristics in terms of thread length and thread depth. For example, questions posted in a Factual category such as Computers & Internet tend to have a few long replies, while questions posted in an Advice or Discussion category such as Family & Relationships and Sports tend to have many replies with moderate length.

2.1.3.2 Why People Ask Questions Using Social Q&A Services

While most research on social Q&A services has focused on those who answer questions, little work has directly examined why people use social Q&A services to seek information. Despite this relatively small body of work on askers' motivations for using social Q&A services to find information, several common reasons why people turn to social Q&A services to seek information have been identified.

The results of analysis of large data sets crawled from social Q&A services indicate that responsiveness and diversity of answers resulting from a large community appear to be two main reasons that people use social Q&A sites for their information needs (Radford et al., 2012). Numerous researchers have recognized the importance of having a large user base as a key to the success of social Q&A sites (Harper et al., 2008; Kim, 2010; Shah et al., 2008). For instance, Yahoo! Answers developed a responsive community based on active user participation. Its better performance in answering questions compared to a smaller social Q&A site, Live QnA was attributed to its large and active user base (Harper et al., 2008; Shah et al., 2008). Shah's (2011) study also provided evidence of the responsiveness of Yahoo! Answers, reporting that the majority of the questions posted on Yahoo! Answers received at least one answer within a few minutes. According to Nam et al. (2009), users of Naver Knowledge-IN believe that the site is useful to obtain various types of information and diverse opinions from a large group of people.

Furthermore, it seems that people use social Q&A services as complementary means of searching for information in the process of information seeking. Kitzie, Choi, and Shah (2012) suggested that people use online Q&A services to obtain an answer to a question that could not be found quickly via a search engine, although their study looked at different types of Q&A services including social Q&A services. Kim (2010) also found that some Yahoo! Answers users came to the site because they could get answers to

difficult questions that could not be easily answered by traditional Web search engines, and that some used Yahoo! Answers as a last resort when searches using other sources failed. In addition, several question askers used the site to confirm information they gathered from other sources (Kim, 2010). The fact that people can receive personalized answers to their questions has also been found to be one of benefits of social Q&A services (Shah et al., 2008; Yang et al., 2011).

2.1.3.3 What Kinds of Questions People Are Asking on Social Q&A Services

A large number of studies have examined what kinds of questions people ask on social Q&A services by conducting content analysis of data sets obtained from such services. As these services allow people to ask questions on a broad range of topics, there is a huge range of question types, and the prevalence of question type differs by category (Nam et al., 2009). Specifically, on social Q&A services, people ask many types of questions such as factual, advice-seeking, discussion-oriented, opinion-oriented, procedural, or task-oriented, across a number of topic categories (Adamic et al., 2008; Nam et al., 2009). The question types can be broadly classified as either conversational or informational (Harper et al., 2009). Conversational questions include opinion- or discussion-oriented questions or questions of self-expression, while informational questions include fact- or advice-oriented questions (Harper et al., 2009).

As mentioned previously, social Q&A sites are purposefully designed for information-oriented interaction and question asking and answering rather than conversation or discussion, and thus they usually do not support conversation or discussion functionality (Adamic et al., 2008; Nam et al., 2009). For example, in order to initiate interactions among users, someone must first post a question, and discussion or conversation then takes the form of either an answer to or a comment on the question. However, research findings indicate that people use social Q&A sites not only for question asking and answering but also for conversation or discussion.

According to Harper et al. (2009), conversational questions are common on social Q&A sites, with 32.4% of the questions in their sample collected from three social Q&A sites (i.e., Yahoo! Answers, Answerbag, and Ask Metafilter) being conversational. In addition, Kim et al. (2007) reported that a large proportion of their data (i.e., 63%) consisted of opinion or suggestion-type questions. Similarly, Choi, Kitzie, and Shah

(2012) observed that questions seeking other users' thoughts, ideas, or recommendations rather than objective information or facts are more prevalent in a community-based social Q&A service than in expert-based and collaborative Q&A services. Moreover, there are some dedicated users of social Q&A sites who regularly post their opinions rather than providing technical and factual answers (Welser et al., 2009).

In addition to this dichotomy of question types, some researchers have proposed different typologies of questions in the context of social Q&A services. For instance, Chen, Zhang, and Levene (2012) proposed to classify questions into three categories according to their underlying user intent, which included subjective, objective, and social. The intent of subjective questions is to get personal opinions or general advice about something, the intent of objective questions is to get factual knowledge about something, and the intent of social questions is to have social interactions with other users rather than seek information. Harper, Weinberg, Logie, and Konstan (2010) offered a new rhetorically grounded taxonomy of question types, suggesting six categories of question types: advice, identification, (dis) approval, quality, prescriptive, and factual, under three rhetorical categories of deliberative, epideictic, and forensic.

While most studies have looked at questions across entire categories available on social Q&A services, a small number of studies have explored typologies of question types in one specific category (e.g., health), and have developed a category-specific or disease-specific typology (Bowler, Oh, He, Mattern, & Jeng, 2012; Oh, Zhang, & Park, 2012). Oh et al. (2012) proposed a coding scheme for content analysis of health questions asked in the social Q&A context. This includes demographic information, disease-specific information, socio-emotional information, daily life information, risk factor, and other information. Bowler et al. (2012) categorized eating disorder-related questions asked by teens on Yahoo! Answers into five types: seeking information, seeking emotional support, seeking communication, seeking self-expression, and seeking help to complete a task.

2.1.3.4 Why People Do or Do Not Answer a Question on Social Q&A Services

As the contributions of answerers play a critical role in maintaining social Q&A services, numerous studies have investigated why people voluntarily answer questions on social Q&A sites. It appears that both intrinsic and extrinsic motivation play a role in

encouraging people to answer questions. Intrinsic motivation includes personal ownership, subjective preference, self-interest, commitment to a perceived social role, enjoyment, feelings of gratitude and respect, perceived value, interaction, online social cognition, reciprocity, altruism, and learning (Kitzie et al., 2012; Nam et al., 2009; Raban & Harper, 2008). Extrinsic motivation includes ratings, points, monetary incentives, access to technology, generalized exchange, reputation, status, norms, communality, social/cultural capital, and business reasons (Nam et al., 2009; Raban & Harper, 2008). Oh (2012) investigated motivations of answerers in the health domain specifically and found that the top three factors that motivated people to answer health questions were altruism, enjoyment, and efficacy.

Additionally, one's decision to answer questions is influenced by one's initial experience on a social Q&A site. Answerers tend to continue to contribute to social Q&A sites if their contribution is acknowledged in various ways such as being named the best answer, being awarded points, and receiving comments from other users (Yang et al., 2010).

Unlike questions asked on SNSs, people answer questions coming from unknown people in the social Q&A setting. Therefore, people may be more selective in deciding on a question to answer. Prior to generating and posting an answer, people need to make a decision about whether or not to answer it through an assessment of the question. Research has found that when assessing a question, people consider various factors including resources available, question-specific contexts, and asker-related properties.

The availability of an answerer's resources in terms of time, effort, and expertise seems to be the most important factor in deciding whether or not to answer a question. In general, people tend to answer a question when they have time, when they know the answer, or if the question is easy enough for them to answer quickly (Dearman & Truong, 2010; Nam et al., 2009). People also tend to avoid wasting effort on questions that have already been adequately or numerously answered (Dearman & Truong, 2010; Nam et al., 2009). However, people are sometimes willing to answer a question that requires their expertise to establish an online status, and to answer a difficult question if they perceive it as an opportunity to enhance their learning or if they can earn high rewards (Nam et al., 2009).

Question-specific factors such as points, monetary awards, or the number of competing answers also affect decisions about whether to answer a question. Yang, Adamic, and Ackerman (2008) examined user behavior in Taskcn, a Chinese Witkey website. A Witkey website is a new type of knowledge market website in which a user offers a monetary award for an answer or task and other users provide solutions to compete for the award. Findings indicate that users' strategies for selecting tasks changed over time as they gained experience, and users tended to select tasks that were less competitive in order to enhance their odds of winning.

Properties related to the question asker, such as the asker's attitudes or history, are another factor that people consider when deciding whether to answer a question. By analyzing homework question-answer pairs posted on Answerbag, Gazan (2007) determined that there are two types of questioners: seekers and sloths. Seekers are those who interact with the community about their question once they post it, while sloths are those who post their question word for word without further interaction. The results indicate that Answerbag users distinguished between homework questions submitted by seekers and those submitted by sloths and greatly preferred those submitted by seekers. These questions drew much higher ratings, more answers, and more answer comments.

The effect of an asker's attitude or history on an answerer's behavior was also observed in Yang et al.'s (2010) study, which found that askers who put in more effort by asking more and longer questions tend to obtain more answers. Dearman and Truong (2010) also reported that Yahoo! Answers users tend not to answer a question if it is insincere or violates community guidelines, if there is a possibility that a question asker will become offended or will report their answer, or if the question is trivial or indicates that the question asker made little effort to find the answer on their own.

People exhibit different patterns in terms of sources they use to generate an answer once they decide to answer a given question. Gazan (2006) suggested that there are two types of answerers in Answerbag, depending on their referencing practices. Specialists were defined as those who proclaimed their expertise and answered a given question without making reference to any other source, while synthesists were defined as those who made explicit reference to other sources of information to support their answers. Overall, across most topical categories, answers that contained references to

other sources tended to be rated more highly than those that contained no references. However, answers provided by specialists were preferred in categories related to professional fields and personal areas such as parenting, divorce law, criminal law, taxes, Mormon religion, and relationships.

Oh et al. (2008) investigated what types of sources people prefer to cite when answering questions on social Q&A sites. They collected answers from Yahoo! Answers and categorized sources used in those answers in terms of accessibility (human, online, and offline) and genre (human, mass media, book, and internet), and compared sources used across topical subjects. With regard to accessibility, human sources were still the top source of information even on social Q&A sites. Genre of sources cited varied depending on topical categories, as a large proportion of answers in the categories of Health, Home & Electronics, and Society & Culture cited human sources, while answers in Computers & Internet included mostly Internet-based sources of information. The effect of topic category on answering behavior appears to be robust (Oh et al., 2008; Welser et al., 2009).

2.1.3.5 What Affects Answer Quality and Quantity on Social Q&A Services

As the primary intent of social Q&A service users is to obtain answers to their questions, it is natural that a large number of studies have looked at what influences answer quality and answer quantity in social Q&A contexts.

a. Factors Influencing Answer Quality on Social Q&A Services

While how well a question is answered on social Q&A sites varies depending on the site, in general, social Q&A services are characterized by high answer diversity and responsiveness (Harper et al., 2008). For example, according to Shah (2011), on average a question posted on Yahoo! Answers received five to six answers and more than 90% of the questions received at least one answer within an hour. Despite these advantages, it appears that there exists substantial variance in answer quality (Harper et al., 2008).

As mentioned previously, the benefits of high responsiveness and greater diversity on social Q&A sites are potentially offset by qualitative shortcomings such as low-quality answers. Therefore, much research has been conducted on answer quality in social Q&A settings from multiple perspectives. Studies from a qualitative perspective

have conducted content analysis of answers to evaluate answer quality or have conducted content analysis of comments accompanying the best answers to identify criteria used to select the best answer. The former tended to use the ratings given by third parties, while the latter used ratings provided by site users, including question askers and general users, as measures of answer quality (Harper et al., 2008). Overall, it is agreed that answer quality differs by topic category and service (Fichman, 2011; Harper et al., 2008).

Findings from this line of research demonstrate that the assessment of the quality of answers posted on social Q&A sites can be based on the property of an answerer, of an asker, and of answer content. People consider an answerer's track record or history when selecting the best answer, giving higher ratings to answers provided by an individual with a good reputation (Adamic et al., 2008; Nam et al., 2009). In a similar vein, Golbeck and Fleischmann's (2010) experimental study suggested that an answerer's self-described expertise in the answer increase an asker's trust in the answerer in an online community context.

Along with the property of an answerer, properties of an asker, such as domain expertise and familiarity, influence the assessment of answer quality. Oh, Yi and Worrall (2012) compared the quality assessment of answers to health-related questions on Yahoo! Answers by experts (i.e., librarians and nurses) and general users. They found that general users gave higher ratings across almost all criteria than librarians and nurses. Golbeck and Fleischmann (2010) reported that whether an asker has a personal connection to the topic being discussed determines the effect of a photo cue on trust in an online community setting; only those who had no personal connection considered an answerer with a photo more trustworthy.

Properties of answer content, such as answer length and the number of links included in the answer, have also been found to affect people's judgment of answer quality. With regard to the length of an answer, research findings offer mixed results as there are people who tend to give higher ratings to answers that are longer (Adamic et al., 2008; Harper et al., 2008; Yang et al., 2010), while some users prefer short and concise answers (Kim et al., 2007). Such conflicting results may be due to confounding effects resulting from other factors that influence users' perceptions of answer quality, such as the category of the topic or the type of question (Harper et al., 2008; Kim et al., 2007).

By contrast, the number of sources or links contained in an answer has consistently been found to have a positive relationship with answer quality (Gazan, 2006; Harper et al., 2008; Kim et al., 2007). Interestingly, properties of question content, such as the way of questioning, appear to have no effect on answer quality (Harper et al., 2008).

b. Factors Influencing Answer Quantity on Social Q&A Services

Prior work from a quantitative perspective has examined factors that affect objective measures of outcomes such as the number of answers. Moreover, studies using an information retrieval-oriented approach (e.g., Blooma, Goh, & Chua, 2012; Shah & pomerantz, 2010), which are highly prevalent, have focused on identifying ways to enhance performance of social Q&A services by developing an algorithm to predict answer quality.

Research has identified several factors, including question length, question topic, and question type, that affect the number of answers received. Yang et al. (2010) showed that there was a positive association between question length and the number of answers received as those who wrote longer questions attracted more answers. Fichman (2012) reported that the number of answers varied depending on question type as conversational questions had significantly more answers per question compared with informational questions. While Harper et al. (2008) suggested that question topic had a potentially large effect on the number of answers received, based on a regression analysis of their experimental data, they indicated that question type had no effect on the number of answers received.

Most social Q&A sites provide a feature that allows either a question asker or general users to select the best answer among posted answers. This feature has attracted the attention of researchers who are interested in information quality assessment in social Q&A settings because it entails different kinds of judgments compared to evaluation of each individual answer. Research on selection of the best answer has dealt with issues such as prediction of the likelihood of being selected as the best answer and criteria that people used to pick the best answer. The position of an answer and the number of competing answers appear to affect the likelihood of being selected as the best answer. The last answer tends to be picked as the best (Nam et al., 2009; Shah, 2011) and an

answer with a smaller number of competing answers tends to be selected as the best answer (Adamic et al., 2008).

A series of studies conducted by Kim and her colleagues (Kim et al., 2007; Kim & Oh, 2009) identified the criteria people employ when selecting the best answer by analyzing pairs of questions and comments left on the best answers in Yahoo! Answers. They analyzed answer quality evaluation from a relevance judgment perspective. They were particularly interested in understanding the role that socio-emotional factors play in selecting the best answer given the nature of social Q&A sites that encourage interactions among users. Through content analysis, they developed a framework of best answer selection criteria, which consists of six value categories and twenty-three individual criteria. The six value categories include content value, cognitive value, socio-emotional value, extrinsic value, information source value, and utility. They found that the set of selection criteria overlap considerably with many relevance criteria uncovered in previous studies in other settings. However, the dominance of the socio-emotional value category was notable. They argued that dominance of the socio-emotional value category reflected characteristics of the social Q&A environment, indicating that people not only seek specific information but also share subjective opinions and suggestions on social Q&A sites.

In a similar vein, Kim (2010) explored users' experiences of credibility judgment on a social Q&A site by interviewing Yahoo! Answers users. She emphasized the process of credibility judgment in a social Q&A environment, arguing that credibility judgments on a social Q&A site are better understood in the broader context of an information-seeking process because they are closely connected to the selection of the site, pre-search activities, and post-search verification behaviors. Kim identified twenty-two criteria and classified them into three categories: message, source, and others. Message criteria include accuracy, clarity, completeness, detail, fact, layout, length, logic, novelty, spelling and grammar, tone of writing, and topicality. Source criteria include answerer's attitude, known answerer, perceived expertise based on the answer, perceived expertise based on an answerer's profile, reference to external sources, and self-claimed expertise or qualification. Other criteria include ratings of the answer, usefulness, and verifiability. Kim reported that when evaluating credibility, people did not apply the same set of

criteria to every answer in an equal manner. They noticed certain salient attributes associated with each answer, such as its structure and perceived expertise of the answerer, and made a judgment.

There have been several studies that examined the interaction between answer quality and responsiveness. The results seem mixed as several researchers have indicated that better answers tend to appear later (Kitzie et al., 2012; Shah, 2011), while some have suggested that there are no significant correlations between answer quality and responsiveness (Chua & Banergee, 2013).

2.1.4 Summary

Social Q&A services are online social services that people use to seek help from a crowd of unknown people to meet their information needs. Users of social Q&A services engage in various information activities such as asking, answering, and commenting through interactions with other users and information provided by them. Social Q&A services share common characteristics with other longstanding and more recent online services including Usenet newsgroups, discussion forums, and SNSs, in that they allow people to use distributed human mediation to seek information and thus enable them to obtain more subjective and personalized information. However, in the context of social Q&A services, this interaction with a large group of people in the process of seeking information online (i.e., broadcasting their questions to a crowd of unknown people by publicly posting them to the site and receiving crowd-generated answers) takes place on a much more massive scale.

While prior work has examined what questions those who seek information post on social Q&A sites and how askers evaluate answer quality, attention mostly has focused on understanding those who answer questions. This has been due to the fact that social Q&A services have been examined primarily as online communities that produce user-generated content. Examining social Q&A services under the framework of social search will help us better understand how people's information-seeking and information-evaluation practices are shaped by interactions with a crowd of unknown people that take place in the process of seeking information using social Q&A services.

2.2 Credibility Assessment on the Web

Once information is found and obtained, one should evaluate the information to make sure that it satisfies one's information need. As a principal component of information quality, credibility plays an important role in the process of information evaluation. In the Web environment, in particular, assessing credibility is critical because individuals usually have to make their credibility judgments without the help of information professionals such as librarians (Nicholas, Huntington, Williams, & Dobrowolski, 2004).

2.2.1 Characteristics of the Web Environment

The Web is characterized by the free flow of information. Information posted on the Web may not be subject to filtering through professional gatekeepers, and traditional authority indicators such as author identity or established reputation are often absent (Danielson, 2005; Flanagin & Metzger, 2000, 2008; Metzger, Flanagin, Eyal, Lemus, & McCann, 2003; Sundar, 2008). Additionally, there is no universal standard for posting information online, so digital information can be easily altered, plagiarized, misrepresented, or created anonymously under false pretenses (Fritch & Cromwell, 2001; Metzger, 2007; Metzger et al., 2003).

In sum, the quality control mechanisms found in traditional media are absent on the Web (Flanagin & Metzger, 2007; Fritch & Cromwell, 2001; Metzger, 2007). As a result, the evaluation of information that used to be done by information professionals is now the responsibility of individuals (Flanagin & Metzger, 2000; Lankes, 2008; Metzger, 2007; Metzger et al., 2003; Nicholas et al., 2004; Sundar, 2008).

The problem is that people find it difficult to evaluate information on the Web due to the lack of quality control mechanisms (Flanagin & Metzger, 2000; Rieh, 2002). A number of studies also found that few users rigorously assess the quality of the information they obtain online and those who do usually use a single or a small number of criteria, such as website design and navigability (Flanagin & Metzger, 2000, 2007; Metzger, 2007; Metzger, Flanagin, & Medders, 2010).

Furthermore, given the characteristics of the Web environments, it is often difficult to understand or authenticate sources of information, or where information comes from (Danielson, 2005; Flanagin & Metzger, 2008; Metzger et al., 2010). For

example, information about sources is absent in some cases, while in other cases, source information is available, but difficult to make sense of (Flanagin & Metzger, 2008). On top of this, the fact that the source of online information may be attributed to the author of the content on a particular website, aspects of the content, the sponsor of the site, or even the medium itself contributes to the difficulty in attributing the source on the Web (Flanagin & Metzger, 2007).

Source attribution research has emphasized that the source of Web-based information is what or who one believes it to be (Sundar & Nass, 2001). Therefore, individuals tend to distinguish between different levels of sources, and salience of source attributes at the time of evaluation may affect people's credibility assessment (Flanagin & Metzger, 2007). Sundar (2008) also suggested that online transmission of information involves multiple layers of sources, and this confusing multiplicity of sources results in varying levels of perceived credibility.

This argument is supported by findings that source attribution affects the assessment of online information. Sundar and Nass (2001) showed that attribution to different types of sources including visible source, technological source, receiver source (audience), and receiver source (self) resulted in variation in perception of news stories. Their experiment demonstrated that there were significant differences in the ratings of liking, quality, and representativeness of news stories depending on participants' source attributions. Kang, Bae, Zhang, and Sundar (2011) found that online news receivers distinguished between news media and portal sites as sources, and that perceived credibility of the more proximate source (i.e., portal sites) tended to have a greater influence on perceived credibility of a news message.

2.2.2 What is Credibility?

As a principal component of information quality, credibility is the believability of information and of its source. It is a multi-dimensional construct with two main components: expertise and trustworthiness (Flanagin & Metzger, 2008; Fogg & Tseng, 1999; Hilligoss & Rieh, 2008; Hovland, Janis, & Kelley, 1953; Metzger, 2007; Rieh & Danielson, 2007; Wathen & Burkell, 2002). Credibility is not a property of information or of a source, but an individual's judgment and perception of the information or source (Flanagin & Metzger, 2007, 2008; Lankes, 2008; Metzger, 2007). According to Fogg and

Tseng (1999), with respect to source credibility, trustworthiness captures perceptions of a source's intent and morality, while expertise represents the perception of a source's knowledge and skill. In a similar vein, Danielson (2005) suggested that expertise refers to one's perception of a source's ability to offer accurate and valid information, whereas trustworthiness addresses one's perception of a source's willingness to offer accurate information, contingent on the source having the ability to do so.

Fogg and Tseng (1999) also classified credibility into four types, depending on the basis of credibility perception. These include presumed credibility, reputed credibility, surface credibility, and experienced credibility, which are based on one's general assumptions, reports from third parties, simple inspection, and first-hand experience, respectively.

A number of survey papers on credibility (Rieh, 2010; Rieh & Danielson, 2007) have acknowledged fundamentally different approaches that various disciplines including library and information science (LIS), communication, psychology, management sciences, marketing, and human-computer interaction have been taking, along with the different goals and presuppositions those disciplines bring to bear when examining credibility. Such differences are well captured in a comparison between the fields of LIS and communication, where credibility research has been most actively conducted (Rieh, 2010).

Historically, scholarly investigation of credibility dates back to the work of Hovland and colleagues (Hovland et al., 1953), which examined the effect of source characteristics on a recipient's acceptance of message, and has long been considered seminal research (Rieh, 2010; Rieh & Danielson, 2007). In the field of communication, examination of credibility has been taking place around three distinctive dimensions of source, message, and media (Metzger et al., 2003; Rieh, 2010; Rieh & Danielson, 2007). Research on source credibility has identified a wide range of factors that influence one's perceptions of the credibility of a source, including dynamism, composure, sociability, liking, and similarity (Metzger et al., 2003). With regard to research on message credibility, communication researchers have examined various characteristics of messages in terms of message structure, message content, and message delivery in order to identify its effect on one's perception of believability of its source or the message itself

(Metzger et al., 2003). Examples of such characteristics include organization of the message, information quality, language intensity, message discrepancy, and fluency. With respect to examination of media credibility, a large number of studies have been conducted to investigate the relative credibility of various media used by a source to send a message, including newspapers, radio, TV, magazines, and the Internet (Metzger et al., 2003). Media credibility-related work has found that both technological features and structural features of media have an impact on one's perceptions of believability.

On the other hand, in the LIS field, credibility research has been conducted with an emphasis on the evaluation of the quality of information contained in documents, investigating people's judgments of documents in terms of how relevant the document is (Rieh, 2002, 2010; Rieh & Belkin, 1998; Rieh & Danielson, 2007).

Credibility differs from other concepts related to information evaluation, such as trust, quality, and cognitive authority. Trust pertains to the perceived likelihood of behavioral intentions, indicating a positive belief about the perceived reliability of, dependability of, and confidence in a person, object, or process (Danielson, 2005; Fogg & Tseng, 1999). Information quality relates to people's subjective judgments about information, specifically dealing with the assessment of how good and useful information is in certain information-use settings, based either on people's own expectations of the information or on other information available to them (Rieh, 2002). Credibility is often considered as a chief aspect of information quality (Hilligoss & Rieh, 2008). Cognitive authority refers to influences that a user would recognize as proper because the information therein is thought to be credible and worthy of belief (Hilligoss & Rieh, 2008; Rieh, 2002; Rieh & Danielson, 2007). Cognitive authority can be ascribed to not only individuals but also books, instruments, organizations, and institutions (Rieh, 2002).

2.2.3 Theories and Models of the Credibility Assessment Process

The prominence-interpretation theory proposed by Fogg (2003) suggests that online credibility assessment entails two phases: noticing an element and making a judgment about the noticed element. The former refers to prominence, while the latter refers to interpretation. This iterative and subconscious process is influenced by a number of factors at each phase. Whether a website element is likely to be noticed is dependent on a user's involvement and experience, type of task involved, topic of the website, and

individual differences, while how a person judges the noticed element is dependent on a user's assumptions, skill/ knowledge, and context.

While there are few theories on the information evaluation process, a number of models describing the information evaluation process have been proposed and have concurred in their assessment that it is multifaceted and that it is an iterative process consisting of multiple steps.

Fritch and Cromwell (2001) proposed a model for ascribing cognitive authority to Internet information in terms of author competence and trustworthiness, document validity, overt affiliation, and covert affiliation. In this model, all input information is divided into four classes: author, document, institution, and affiliation. Information in each class is assessed in a class-specific way and then individual class assessments are combined to gain an overall assessment of cognitive authority for the given information. This model is iterative, and the assessment of overall cognitive authority tends to converge to a stable solution over time.

Wathen and Burkell (2002) proposed a model for how people judge the credibility of online information. The process begins with judging surface credibility by assessing appearance/presentation, usability/interface design, and organization of information. Then, users evaluate message credibility in terms of source and message by looking at expertise/competence, trustworthiness, credentials for source and content, relevance, currency, accuracy, and tailoring for message. They then assess the content of information, and this may be mediated by personal properties such as knowledge, time, and familiarity.

Rieh's (2002) two-step approach to Web users' judgment and decision processes can be understood as the process-oriented approach. Based on Hogarth's (1987) judgment and decision-making theory, Rieh suggested that Web users' judgment and decision processes consist of two steps, predictive and evaluative judgment. Predictive judgment refers to what people expect to happen, while evaluative judgment involves the values by which they express preferences. Findings from her research demonstrate that knowledge is a primary factor in influencing predictive judgment and that users take account of source characteristics while making both predictive and evaluative judgments.

A dual process approach based on information processing theories has also attracted researchers' attention with respect to modeling credibility assessment. According to the elaboration likelihood model (ELM), people can process information either centrally or peripherally (Fogg & Tseng, 1999; Sundar, 2008). Whether people choose the central or peripheral processing route depends on the level of their involvement with the issue and their ability to process information. People process information centrally when they are highly involved with an issue and are able to invest adequate cognitive resources (Fogg & Tseng, 1999; Sundar, 2008).

Similarly, the heuristic-systematic model (HSM) distinguishes between systematic processing and heuristic processing. The former involves a detailed analytical consideration of information under judgment, whereas the latter relates to reliance on mental shortcuts or "rules of thumb" to make a judgment about information (Sundar, 2008).

A dual processing model of credibility assessment based on information processing theories indicates that people exert different levels of effort when evaluating credibility, depending on their motivation and ability (Aumer-Ryan, 2009; Metzger, 2007; Metzger et al., 2010). This approach allows us to understand when and how people make an effort to assess credibility. Individuals go through a heuristic process by using readily available cues such as website genre and design when motivation is low, while they go through a systematic process by assessing message content when motivation is high (Aumer-Ryan, 2009; Flanagin & Metzger, 2007).

Three prototypical models of computer credibility evaluation proposed by Fogg and Tseng (1999) are examples of the dual processing model of credibility assessment. These prototypical models include binary evaluation, threshold evaluation, and spectral evaluation. They suggested that the type of model one follows when assessing computer credibility would be dependent on the degree of one's involvement and ability.

Empirically, Kang et al. (2011) showed the effect of high involvement on credibility judgment, specifically on source attributions of online news. In identifying sources of online news information, those who were highly involved tended to inspect the credibility of both proximal source (i.e., portal site) and distal source (i.e., news media), while those with low involvement tended to consider only the most proximate source.

This dual process appears to allow people to cope with information overload by minimizing their cognitive effort and time spent through the use of cognitive heuristics (Metzger et al., 2010). Cognitive heuristics constitute information-processing strategies consisting of useful mental shortcuts, rules-of-thumb, or guidelines that reduce cognitive load during information processing and decision-making (Metzger et al., 2010).

A theoretical framework of credibility assessment developed by Hilligoss and Rieh (2008) recognized the important role of heuristics in people's credibility judgment processes. It includes three distinct levels of credibility judgments: construct, heuristics, and interaction. The construct level relates to how users conceptualize credibility. The heuristics level entails credibility assessment based on general rules of thumb. The interaction level involves effortful assessment of specific sources or content cues. With respect to heuristics, they identified four general rules of thumb used to make credibility judgments: media-related heuristics, source-related heuristics, endorsement-related heuristics, and aesthetics-based heuristics.

Based on analysis of data obtained from focus group sessions, Metzger et al. (2010) also identified five cognitive heuristics mainly used to make credibility judgments. They include reputation, endorsement, consistency, expectancy violation, and persuasive intent.

In describing the role of heuristics in credibility assessment of online information, Sundar (2008) focused on technological affordances in digital media instead of source and content of digital media, which have traditionally been considered important in shaping credibility assessment. The MAIN model proposed by Sundar (2008) identified four affordances that have demonstrated significant psychological effects in the process of online information credibility assessment: Modality (M), Agency (A), Interactivity (I), and Navigability (N). He claimed that technological affordances enabled by features offer cues that trigger cognitive heuristics and that these cues affect the perception of credibility of online information.

A number of studies have confirmed that heuristics play a significant role in credibility assessment and related decision making in various contexts. Lackaff and Cheong (2008) identified that students utilized heuristics such as the presentation and organization of information when assessing online information. Forman, Ghose, and

Wiesenfeld's (2008) finding that people used information about the identity provided by reviewers to make purchasing decisions demonstrated that people process information heuristically in order to deal with an overload of information in the form of numerous online reviews.

In a similar vein, Flanagin, Metzger, Pure, and Markov (2011) reported that people employed cognitive heuristics in evaluating product quality, attending to average product ratings rather than focusing on the number of ratings provided. People's reliance on a simple cue when evaluating online information was also confirmed by Fu and Sim's (2011) study which found that videos showing higher view counts by a given time attracted a larger share of subsequent views than those showing lower counts.

2.2.4 Collective Credibility Assessment in the Web Environment

The open nature of the Web has changed what constitutes credibility, resulting in a shift from a model of single authority to a model of multiple distributed authorities (Flanagin & Metzger, 2008; Lackaff & Cheong, 2008; Lankes, 2008). Flanagin and Metzger (2008) pointed out that the traditional view of authority as single and centralized has been questioned in the Web environment, and as a result, a concept of multiple distributed authorities depending on information abundance and networks of individuals has emerged.

In a similar vein, Lankes (2008) claimed that models of credibility have changed from traditional authorities to "reliability approaches" where the user determines credibility by synthesizing multiple sources of credible judgments. In the Web environment, people encounter many authorities and face the problem of choice. As a result, they take the reliability approach and determine credibility by synthesizing multiple sources.

Furthermore, Lackaff and Cheong (2008) suggested that there exists another form of authority on the Web, "authority from below," emphasizing the process of online information creation and organization as the origin of authority. They demonstrated that this "authority from below" may replace more traditional forms of authority coming from an institution or individual in students' credibility assessment of online information.

People's use of aggregated user-generated information enabled by social tools and services in the process of online information assessment attests to this newly emerged

model of multiple distributed authorities to some extent. Since individuals have few cues to rely on when assessing online information, they are becoming more dependent on information provided by other users on the Web, tapping the collective intelligence of Web users (Jessen & Jørgensen, 2012; Lankes, 2008; Metzger et al., 2010; Rieh, Kim, Yang, & St. Jean, 2010). Therefore, information credibility assessment on the Web has become a social process (Flanagin & Metzger, 2008; Metzger et al., 2010).

The theory of aggregated trustworthiness proposed by Jessen and Jørgensen (2012) underscored a dynamic of this social process characterizing today's participatory Web. They pointed out that the social element attached to information, such as collective judgment of information like feedback from others, plays an important role in the credibility assessment of online information. People gather multiple trustworthiness cues to form an aggregate credibility judgment when interacting with information on the Web, where the source of information is often hard or impossible to identify.

A number of recent studies have suggested that the concepts of warranting/ signaling may provide a more complete picture of the processes by which people are influenced by social information online (Flanagin & Metzger, 2013; Walther & Jang, 2012; Willemsen, Neijens, & Bronner, 2012). People tend to place more weight on information that is unaffected by manipulation when they use cues available in the credibility assessment process online. For example, according to Willemsen et al. (2012), people found cues about sources such as "top reviewers" or "advisor" badges, which were provided by other users, more compelling when evaluating the credibility of online reviewers because they believed that these cues were based on peer ratings which could not be manipulated.

While prior work has suggested that people are more likely to rely on information provided by others when assessing information online, interestingly, some studies showed contradictory results. In their study of the social voting mechanism at IMDb, Otterbacher, Hemphill, and Dekker (2011) found that users did not appear to use information about reviewers' reputation which was based on the community's collective assessment of the helpfulness of previous contributions when evaluating reviewers' contributions. In addition, Giudice (2010) indicated that only 30% of their participants

reported using social feedback information (i.e., presence and number of thumbs up/thumbs down) in their evaluation of web page credibility.

Given that most studies that identified the effect of social information on credibility assessment were conducted in lab-based settings, it appears that people recognize the importance of social information when evaluating information online if they are instructed to pay attention to it, while they tend to ignore it in their daily lives. Therefore, more research is needed to further investigate the role of social information in the process of online credibility assessment.

2.2.5 Factors Influencing Information Evaluation

Various factors including attributes of individuals who consume and provide information, tasks in which they engage, the information with which they interact (i.e., content), social information provided by other people, and media that is used to deliver information have been shown to influence information evaluation on the Web.

With respect to attributes of information consumers, one's domain expertise and experience with technologies have been found to affect the way that a person evaluates information online. Jenkins, Corritore, and Wiedenbeck (2003) found that those with more domain expertise tend to make judgments about information more critically by using their domain knowledge, while those with no domain expertise assess information based on general heuristics. Rieh (2002) also reported that individual knowledge was a primary factor in influencing predictive judgment.

A series of studies conducted by Lucassen and Schraagen (2011, 2012) showed that information evaluation behavior differed depending on whether one has domain expertise or not, with those who had domain expertise tending to be influenced by the accuracy of presented information and tending to focus more on semantic features than individuals without domain expertise.

The results on the effect of one's experience with technologies on perceived credibility seem mixed. Flanagin and Metzger (2000) reported that those who have more experience with the Internet are somewhat more likely to view it as a credible source of information, but did not find the Internet to be more credible than other media. The extent of user Internet experience was also positively related to the degree of verification employed, as less experienced users were less likely to verify information. Similarly,

Flanagin and Metzger (2008, 2013) found that individuals who were more familiar with a particular geographical information providing service tended to consider it credible, and those who were more involved in online content contribution tended to perceive online information such as ratings credible.

In contrast, Flanagin and Metzger (2007) found that experience using the Web did not impact participants' credibility judgments. However, they noted that those who had more Internet experience reported that they invested more effort in information verification on a survey, while these participants actually exerted less effort in information verification in an experiment, showing a discrepancy between self-reported behavior and observed behavior.

The effect of factors related to information providers on information evaluation on the Web has been mostly investigated in terms of source identification in the context of online reviews. People appear to be influenced by identity-descriptive information and expertise-descriptive information on online reviewers when assessing helpfulness of online reviews and credibility of online reviewers. Interestingly, self-disclosure of identify-descriptive information in the form of a profile has a strong positive effect on the perceived helpfulness of an online review and the sales of the product (Forman et al., 2008), while self-proclaimed expertise-descriptive information included in the review show an ironic effect (Willemsen et al., 2012).

Specifically, self-proclaimed expertise in a review positively affects the perceived expertise of the reviewer, while it negatively affects the perceived trustworthiness of the reviewer. However, if the expertise claims are provided by others in the form of ratings, there is no ironic effect, and the reviewers are considered to be both experts and trustworthy.

Similarly, Flanagin and Metzger (2013) identified a positive association between system-provided expertise-descriptive information and the perceived credibility of information as participants perceived movie ratings originating from those who are described as expert movie critics by the system more credible, more accurate and more reliable than ratings from fellow users.

Furthermore, Park, Xiang, Josiam, and Kim's (2013) study investigated the effect of a reviewer's self-disclosed personal profile information on individuals' assessments of

travel reviewers, showing that people's judgments of the reviewer's credibility were influenced by the perceived congruence between self-disclosed reviewer location and travel interest and the content of the review.

Depending on task type, individuals employ different strategies to assess usefulness of information over the course of the search process. In a lab experiment conducted by Tombros, Ruthven, and Jose (2005), participants were given three different types of tasks: background search, decision task, and many items task. The background search asked participants to find as much general background information as possible on a topic. The decision task involved gathering information and making a decision based on the information found while searching. The many items task involved compiling list of items. Results indicate that people rely on different features of Web documents when judging usefulness. For instance, people appeared to rely more on superficial cues for background search, which was perceived as the most difficult task.

The type of information sought appears to affect credibility assessment and determine the amount of effort invested in assessing information. Flanagin and Metzger (2000) found that individuals perceive news, reference, and entertainment information as more credible than commercial information. They also reported that the amount of effort people invested in verifying information varies depending on the risk caused by misinformation; information is verified less rigorously when misinformation is less damaging.

In a lab experiment, Flanagin and Metzger (2007) demonstrated that the genre of a website impacts its perceived credibility. Participants were randomly assigned one of eight websites and were asked to browse it and read a story which was identical across all of the sites. Results show that the genre of a website is related to its information type, which has been found to affect credibility assessment. Different website genres tend to correspond to different website attributes, and these differences may affect perceived credibility as well. Similarly, Fogg, Soohoo, Danielson, Marable, Stanford, and Tauber (2003) noted that people noticed different types of elements when examining different types of websites.

Rieh et al. (2010) investigated the relationships between types of information objects and information content with regard to credibility assessment. The researchers

collected data through a diary survey in which an email was sent to participants five times a day over a period of three days. Results demonstrate that authoritativeness and expertise, which are traditionally core concepts underlying credibility, ranked lower, while accuracy, currency, reliability, trustworthiness, and trustfulness were perceived to be the most important qualities across the variety of websites that respondents used. Respondents also employed different strategies depending on the type of information object, employing different heuristics to assess credibility. People tended to rely on socially-oriented heuristics such as popularity and recommendations for both user-generated content sites and multimedia sites, while they relied on their own knowledge and trust in organizations for traditional websites.

Recently, there has been much work on the effect of social information provided by other people on online credibility assessment as various social technologies which generate a wide range of social information have become increasingly ubiquitous tools for interacting with information online. Research findings on the effect of the volume of social information on online information evaluation appear mixed.

In an experimental study, Giudice (2010) investigated the effect of audience feedback in the form of thumbs-up and thumbs-down by manipulating feedback in terms of the type (negative, positive, mixed, and none) and amount (high and low). The type of feedback, while significant, provided a small effect on overall credibility ratings and the amount of feedback did not affect credibility ratings.

In contrast, Metzger et al. (2010) reported that people use various social means to assess credibility. Participants in their study actively used certain types of user-generated content, including testimonials and reviews. In addition, when using testimonials or reviews, the volume of reviews and whether they included both negative and positive opinions mattered. Similarly, Flanagin and Metzger (2013) found that the volume of movie ratings was positively associated with people's perceived credibility, reliance on the review, and confidence in its accuracy.

Fu and Sim's (2011) work, which tested the video viewership bandwagon hypothesis using an econometric model, indirectly demonstrated a positive effect of the volume of social information. Their results confirmed the bandwagon effect of

viewership at the aggregate level as videos with higher view counts by a given time attracted more viewers subsequently than those with lower view counts.

These conflicting findings regarding the effect of the volume of social information may be due to differences in the forms of social feedback. The volume of feedback may matter for reviews or testimonials, ratings, or viewership, but not so much for thumbs-up and thumbs-down evaluations.

With regard to the effect of media on credibility assessment, Flanagin and Metzger (2000) conducted a survey to measure perceived credibility across five media channels: newspaper, television, radio, magazine, and the Internet. They found that except for newspapers, which were clearly rated highest in perceived credibility, credibility ratings did not vary as a function of medium. Contrary to expectations, information obtained via the Internet was perceived to be as credible as that found through magazines, the radio, and television, irrespective of information type.

2.2.6 Criteria Used for Information Evaluation

In understanding information evaluation behavior, it is important to pinpoint the specific elements people use to assess credibility and assign cognitive authority. Rieh (2002) conducted a lab experiment to investigate how people make judgments of information quality and cognitive authority in the course of their information seeking behaviors. Results indicate that information quality can be characterized by goodness, accuracy, currency, usefulness, and importance, while cognitive authority can be characterized by trustworthiness, reliability, scholarliness, credibility, officialness, and authoritativeness.

Fritch and Cromwell (2001) presented a theoretical framework for gathering and assessing online information with regard to cognitive authority. They suggested four criteria to be considered in ascribing cognitive authority to information on the Internet: author competence and trustworthiness, document validity, overt affiliation, and covert affiliation. Author competence and trustworthiness refers to author identity and credentials. Document validity involves factual accuracy of information, information presentation and format, and organizational or institutional identity and authority. Overt and covert affiliation refers to whether the authority is affiliated with an organization, institution, or individual.

Based on statistical analysis of data drawn from questionnaires, Fogg et al. (2001) identified seven credibility scales that were used to assess website credibility: real-world feel, ease of use, expertise, trustworthiness, tailoring, commercial implications, and amateurism. Fogg et al.'s (2003) later work suggested a large number of elements people consider when assessing credibility of online information.

In a field experiment, they investigated which elements are noticed by people when judging the credibility of online information. Participants were given two randomly-assigned websites out of 100 websites that had been pre-selected and were asked to evaluate the credibility of those sites. The researchers categorized the elements noticed by people when assessing the credibility of a website. Categories included design look, information design/structure, information focus, company motive, usefulness of information, accuracy of information, name recognition and reputation, advertising, bias of information, tone of the writing, identity of the website's sponsor, functionality of the site, customer service, past experience with the website, information clarity, performance on a test, readability, and affiliation.

Similarly, Tombros et al. (2005) investigated what features of web pages users employ when evaluating the usefulness of the pages in relation to given tasks. In a lab experiment, participants were given three different types of search tasks. Tombros et al. identified five categories of criteria used to judge the usefulness of online information: text, structure, quality, non-textual items, and physical properties. Text includes various textual aspects of a web document, such as content, numerical figures, and title. Structure refers to structural aspects of a web document, such as layout and links. Quality broadly refers to qualitative aspects of a web document, such as scope, authority, and recency. Non-textual items include pictures, and physical properties include physical characteristics of a web document, such as file size and connection speed.

Fink-Shamit and Bar-Ilan (2008) conducted a laboratory experiment that instructed participants to perform a scenario-based search task and identified four different evaluative components based on the attributes mentioned and used by their participants. These four components included credibility of site, credibility of content, predictive relevance, and veracity assessment. Specifically, credibility of site consisted of ten elements including author, completeness and scope, accuracy, prior acquaintance with

the site, source, currency, quotes, objectivity, type of reference, and writing style. Credibility of content involved twelve elements including language, design, contact, advertisement, picture and figures, number of links, ease of navigation, layout of page, color, tables and numbers, site update, and font. Predictive relevance consisted of five elements including ranking, language, title, relation to query, and snippet. Lastly, veracity assessment included two elements, previous knowledge and corroboration.

In understanding people's evaluation of online information, Savolainen (2011) focused on relevance, defining quality of information content and credibility of the author of the content as subcategories of relevance. Specifically, he examined quality of a message's information content and credibility of the author of the message in the context of Internet discussion forums. Through content analysis of forum messages, thirteen criteria used in the judgment of the quality of the message's information content and thirteen used in the judgment of the credibility of the author of the message were identified. The thirteen criteria used in the content quality judgments included comprehensiveness, correctness, currency, factuality, novelty, objectivity, official nature, reliability, scholarliness, specificity, usefulness, validity, and variety, while the thirteen criteria employed in the author credibility assessment included author identification, author reputation, expertise, fairness, honesty, non-persuasive, plausibility, presentation qualities, provision of evidence, reference to external sources, similarity to receiver beliefs, trustworthiness, and unbiased. The results also indicated that people appear to employ a few criteria more often than others when assessing information. Criteria such as usefulness, correctness, specificity, and objectivity were frequently used in the judgment of content quality and criteria including reputation, expertise, honesty, and fairness were often employed in the assessment of author credibility.

2.2.7 Summary

Credibility, as a principal component of information quality, has received considerable attention from researchers in a number of disciplines, including information science and communication. Certain properties of the Web have contributed to some trends observed in studies regarding credibility assessment on the Web. For example, unlike offline information, online information lacks cues that can help people assess

information, and thus it has become much more difficult for individuals to make judgments about information.

In addition, the ever-changing nature of the Web environment has led to the emergence of collective credibility assessment that utilizes aggregated social information generated by unknown people on the Web. Investigating credibility assessment practices in social Q&A settings will help us better understand this social process of credibility assessment.

Chapter 3

Research Design

This chapter provides an overview of this study's research design, including the research questions that it addresses. It then describes the social Q&A service that was selected for the study, and the specific methods used for participant recruitment, data collection, and data analysis.

3.1 Overview

To better understand social aspects of Web search behavior, this study sought to examine how people used a social Q&A service as a venue for social search. It investigated people's social search behavior and credibility assessment practices in a social Q&A setting, with emphasis on interactions with a large number of unknown people. The specific research questions were:

1. What are people's general perceptions of a social Q&A service in terms of characteristics, benefits, and costs, and what are the overall characteristics of their use of a social Q&A service?
2. What are people's specific social search practices when posting questions to a social Q&A service in terms of goals, expectations, question formulation, and outcomes?
3. How do people conceptualize and assess credibility in the process of social search when using a social Q&A service?

To address these research questions, data needed to be drawn from individuals' experiences in the context of their daily lives. The analysis of either large datasets crawled from social Q&A sites or of large-scale survey data would not be appropriate, as these methods cannot provide in-depth data that can explain why and how people behave in particular ways, although they can offer aggregate-level understandings of behavior patterns. For the purposes of this research, participants were instructed to use a social

Q&A service for one week by posting their own questions to the site in their natural settings. Figure 1 below shows three steps involved in this study: (1) an introductory meeting; (2) one week's use of a social Q&A service; and (3) a post-use interview.

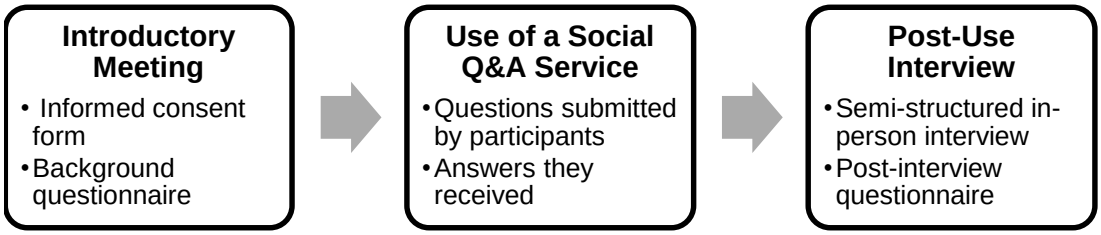

Figure 1: Three-Step Approach

An in-person introductory meeting with each participant was conducted prior to the one week's use of a social Q&A service in order to promote participants' commitment throughout the study. Participants then were asked to use a social Q&A service for one week by posting five questions to the site. At the conclusion of one week, a semi-structured in-person interview was conducted. Although semi-structured interviewing was the primary data collection method used for this study, a few other data collection methods were also used in order to complement the interview data. These additional methods included a background questionnaire and a post-interview questionnaire, which were administered at the end of the introductory meeting and the post-use interview respectively. The content of questions submitted by participants and data about answers they received were also collected by recording on-screen activities during the interview. An overview of data collection instruments used in this study is provided in Table 1 below.

Table 1: Overview of Data Collection Instruments

Data Collection Method	Approx. Time Spent	Description	Appendix
Introductory meeting	10 minutes	Provided participants with an overview of the study	
Background questionnaire	5 minutes	Collected basic demographic information, as well as information about participants' experience using online Q&A services	Appendix D

Data Collection Method	Approx. Time Spent	Description	Appendix
One week's use of a social Q&A service	1 week	Collected questions submitted by participants and answers they received	
Post-use interview	1 hour	Open-ended questions on participants' overall experience with Yahoo! Answers, questions they posted for this study and answers they received, and their credibility assessment	Appendix E
Post-interview questionnaire	5 minutes	Collected data on participants' overall perception of credibility with respect to Yahoo! Answers, and their social search practices in general	Appendix G

This study was controlled to some extent in that participants were instructed to use a social Q&A service for a certain period of time and to post a certain number of questions to the site. However, data on their information-seeking episodes was collected in a realistic environment by letting them post questions on any topic that they were interested in at their convenience.

I chose to use this approach because it would ensure that the level of activities in which participants engaged would be maintained at a consistent level while their activities were carried out in their natural settings. Prior research on user behavior in social Q&A settings has reported the intermittent use of services (Furtado et al., 2013; Mamykina et al., 2012; Nam et al., 2009). In addition, it has been found that in online environments where users generate content users tend to show an initial burst in their level of activity followed by a marked drop (Furtado et al., 2013). This potential problem of variance in the participants' activity level could be addressed by instructing participants to post a certain number of questions for a certain period of time. However, this approach also permitted the collection of data drawn from participants' experiences in situ by allowing them to post their own questions in their natural settings rather than posting questions provided by the researcher.

While this study entailed a combination of various qualitative and quantitative data collection methods, semi-structured in-person interviews around questions participants posted and answers they received was the primary means of data collection. In collecting data on participants' experience, I chose to conduct an interview following

one week's use of a social Q&A service, with a relatively short delay. Concurrent interviews may be considered a better way to gather data on participants' experience, but I believe that this post-use interview approach was the most effective way for the following reasons.

First, participants were asked to post their own questions to the site at their convenience rather than being given prepared questions. Second, it took some time for participants to receive answers to the questions they submitted. This made capturing data on participants' experience in real time through concurrent interviews not feasible. Third, I wanted to collect data on experience that took place in participants' natural settings, not laboratory settings. Fourth, I was interested in understanding the process through which participants engage in information seeking using a social Q&A service, not their use of particular features of the service.

The post-use interviews allowed me to obtain data on participants' experience that was as accurate as possible by restricting the recall task to a short and recent reference period. This also enabled me to reduce bias associated with retrospection (Schwarz, 2007). In addition, I facilitated participants' recall by having a question-answer pair associated with each information-seeking episode on screen during the interview.

Collecting data drawn from participants' first-hand experience using a social Q&A service was also important with respect to understanding how they evaluated information within the social Q&A setting. Prior research on information evaluation in this setting has tended to use ratings provided by third parties such as experts or researchers as proxies for the assessment of information quality, rather than ratings by those who actually asked questions.

This is understandable given that obtaining data related to information quality assessment from users who asked questions would be technically difficult because there is no official way to contact a large number of users on social Q&A services and no guarantee that such contact would lead to successful outcomes. However, using ratings provided by third parties limits our ability to fully understand how users who asked questions assessed obtained information in the social Q&A context. This study allowed me to collect data on assessment of answers and of other users who provided the answers directly from those who asked the questions.

3.2 Selection of Social Q&A Service

Yahoo! Answers (http://answers.yahoo.com/), launched in 2005, was selected as a social search system for this study because it is the largest and most popular social Q&A service. For example, Yahoo! Answers had received 300 million questions as of July 2012, with two questions being asked and six answered per second on average (Yahoo! Answers Team, 2012).

Because Yahoo! Answers enables direct interactions with unknown people on a massive scale, it provides an appropriate venue for studying people's social search behavior. In addition, it offers an opportunity to capture a wide range of information-seeking episodes because people use it to seek a variety of types of information (Adamic et al., 2008; Choi et al., 2012; Harper et al., 2009; Nam et al., 2009). While this openness to various questions allowed me to collect data that covers diverse information-seeking episodes, it also poses a challenge to my data analysis because Yahoo! Answers appears to demonstrate a wide variance in patterns of user behavior depending on topical categories (Adamic et al., 2008). However, it is noted that this variance in the behavior patterns reflects people's behavior at an aggregate level that is based on network attributes or thread attributes of Yahoo! Answers. This study focused on people's information-seeking behavior at an individual level, and thus sought to characterize people's social search behavior based on properties of an individual information-seeking episode regardless of the topical category associated with it.

On Yahoo! Answers, users can engage in various information activities: (1) question asking and answering, (2) question/answer searching, (3) question/answer evaluating, and (4) information managing. As a way to motivate and reward its users, Yahoo! Answers has a system of points and levels (i.e., from Level 1 to Level 7). Users move up to a higher level as they earn points by participating on the site through these various activities.

Users can ask questions on any topic and answer any questions they choose. A question posted by a user will be open for four days, and can be extended for three more days. If a question receives no answer during this open period, it will be deleted from Yahoo! Answers. An open question becomes a reference question once the best answer is determined by either the person who asked the question or someone else. In addition to

question asking and answering, Yahoo! Answers allows users to search and browse existing questions and answers. Figure 2 below shows the front page of Yahoo! Answers.

Yahoo! Answers also provides features that allow users to evaluate questions as well as answers. Users can give a question a star if they see it as interesting or high-

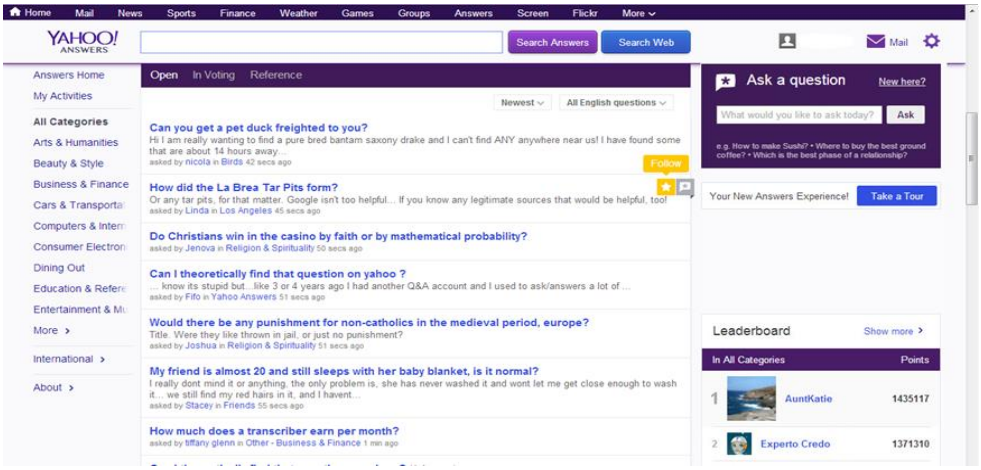

Figure 2: Front Page of Yahoo! Answers

quality. With regard to an answer, users can rate an answer by giving a thumbs-up or thumbs-down rating, and they can also comment on an answer (see Figure 3 below).

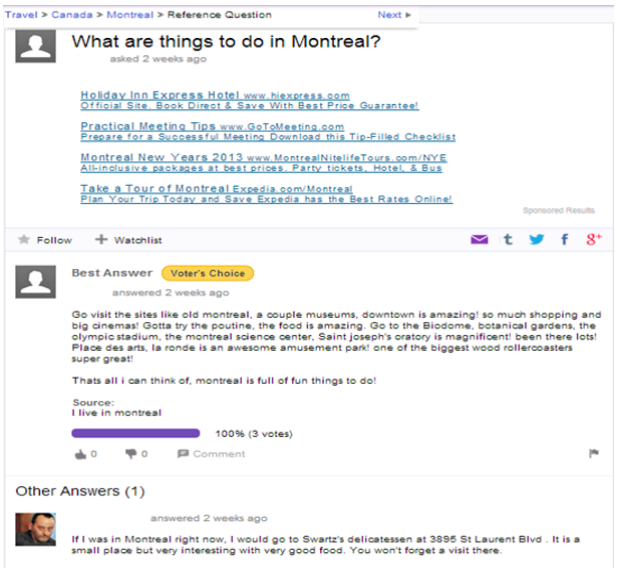

Figure 3: Yahoo! Answers Features for Evaluation of Answers

Moreover, Yahoo! Answers offers a personalized home page that displays information about users, including their points and level, question and answer activities, and Yahoo! Answers network connections (see Figure 4 below).

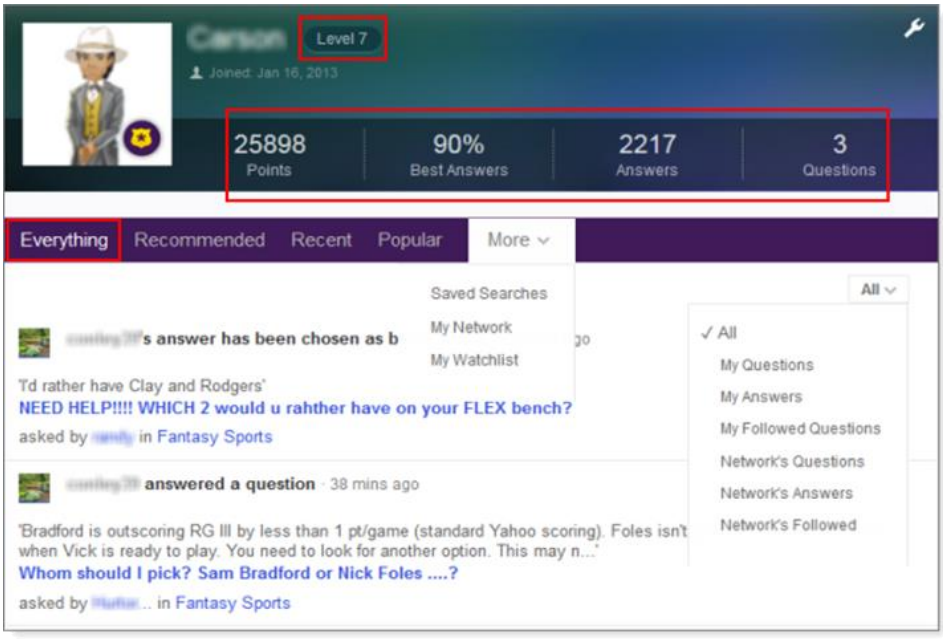

Figure 4: User Profile Page on Yahoo! Answers

3.3 Participant Recruitment

Participants were recruited from the undergraduate student population at a research university in the Midwest. Undergraduate students were selected as the sample population because young adults aged 18 to 29 years are not only the most active information seekers (Purcell, Brenner, & Rainie, 2012) but also the most active users of social media (Duggan & Brenner, 2013).

This study aimed to recruit current users of Yahoo! Answers, and thus those who had a Yahoo! Answers account and had posted at least one question over the last three months at the time of recruitment were eligible to participate. I chose to use a period of three months as a criterion for screening potential participants, as it has been found that more than 70% of users of social Q&A services had stopped the use of service and disappeared by day 100 (Yang et al., 2010).

A total of 78 participants were recruited for this study from February to March of 2014. Recruitment was conducted using a number of different methods. First, flyers were posted around the campus. I also contacted students who previously indicated their interest in participating but were not able to do so when I conducted a pilot study. An email invitation was sent to students who were taking an undergraduate course, SI 110. Lastly, I contacted individual departments, schools, and programs that have undergraduate programs at the university, and five programs (School of Dentistry, School of Business, Computer Science and Engineering Department, School of Education, and School of Nursing) were willing to distribute the recruitment message via their email list on behalf of the researcher.

The recruitment flyer and recruitment email message are shown as Appendix A and Appendix B, respectively. As indicated in these documents, participants were offered $40 as compensation upon the completion of the interview.

3.4 Data Collection Methods

This study involved three stages of data collection: (1) an introductory meeting; (2) one week's use of Yahoo! Answers; and (3) an in-person post-use interview.

3.4.1 Introductory Meeting

The introductory meetings that were conducted prior to participants' one week's use of Yahoo! Answers took place between February 3 and March 12. In this meeting, each participant was provided with an overview of the study. Administration of an informed consent form (Appendix C) and an online background questionnaire (Appendix D) followed. The informed consent form asked participants to consent to participate in the study, to have their interview session audio-recorded, and to have on-screen activities including questions they posted recorded. It also let participants know that they would be paid $40 if they completed the entire study, including the interview and post-interview questionnaire.

The background questionnaire, which was administered directly following the informed consent form, collected basic personal information such as gender, age, year in the program, and major, as well as information about the participant's experience with Yahoo! Answers and other online Q&A services. With regard to experience with Yahoo!

Answers, the background questionnaire asked participants how long they had been using Yahoo! Answers, how actively they had been participating, and what kinds of activities they had engaged in. With regard to experience with other online Q&A services, participants were asked to report whether they had ever used other online Q&A services and what kinds of activities they had engaged in on each site they reported using. At the end of the introductory meeting, the interview that would be conducted after one week's use of Yahoo! Answers was scheduled.

3.4.2 Use of Yahoo! Answers

Participants then were asked to use Yahoo! Answers for a period of one week. During this period, they were expected to post one question per day to Yahoo! Answers, five questions in total. As this study aimed to ensure that participants use Yahoo! Answers in as realistic a manner as possible, they were instructed to post questions on any topic that they were interested in. Participants were encouraged to ask questions they really had questions about rather than random questions. Participants were also instructed to follow the question they posted, read all answers they received, and choose the best answer if applicable.

A reminder about the scheduled interview was sent to participants one day prior to the interview, and participants were asked to reply to the reminder with a list of the questions they posted. This was designed to facilitate the interview and collect as much data as possible during the interview by making sure that I had time to review the questions they posted and answers they received prior to the interview.

3.4.3 Post-Use Interview

At the conclusion of one week, a semi-structured in-person interview was conducted between February 11 and March 21. At the beginning of the interview, participants were asked to log into Yahoo! Answers and open a page that listed the questions they posted. During the interview, discussion of each question and answers received for that question took place while a page that showed the question posted and answers to the question was displayed on the screen of a laptop. Participants' on-screen activities during the interview session were recorded using a screen capture software, Morae. The interview began with questions that focused on each question participants

posted to Yahoo! Answers and the answers they received. With respect to each question, participants were asked to talk about what they had been looking for, how they formulated the question, how they made credibility judgments, and how they perceived the outcome of the information-seeking task. For each search episode, participants were also asked to rate the urgency of the question, their familiarity with the specific subject of the question, their perceived success, and their perceived satisfaction on a scale of 1 – 7 (1 = "not at all" and 7 = "extremely"). To make sure that participants had a clear understanding of what each number meant, a scale sheet that presented each rating question in a written format with descriptions for each rating point was shown to participants, and their verbal ratings were marked in on the sheet. The scale sheet is shown as Appendix F. After going over all questions, participants were specifically asked to discuss their credibility assessment in terms of construct, heuristics, and interaction. Participants were then asked to talk about their prior experience with Yahoo! Answers, overall experience with Yahoo! Answers in relation to this study, and their perception of Yahoo! Answers. The interview protocol is shown as Appendix E. The content of questions submitted by participants and answers they received was collected by recording on-screen activities during the interview.

Following the interview, a post-interview questionnaire (Appendix G) was administered. Participants were asked to report their perception of the importance of various criteria used for credibility assessment in the context of Yahoo! Answers, and overall perception of credibility in relation to Yahoo! Answers. They were also asked to report their experience with question asking using various social media services and their perception of credibility with respect to each form of social media they had experience with. Data about participants' general information-seeking practices was also collected. Monetary compensation of $40 was provided to each participant at the end of the session.

3.4.4 Data Collected

Data including basic personal information, as well as information about the participant's experience with Yahoo! Answers and other online Q&A services was collected at the introductory meeting from participants' background questionnaires. From participants' one week's use of Yahoo! Answers, a total of 406 questions were collected.

The in-person post-use interviews with 78 participants lasted an average of 40 minutes, ranging between 24 to 77 minutes. The interviews resulted in 52 hours of taped interview data and over 1100 pages of transcripts. Additional data gathered during the interview session included ratings regarding several dimensions of search episodes (i.e., urgency, familiarity, success, and satisfaction) collected for each question, and results from participants' post-interview questionnaires. In addition, 72 Morae files that recorded participants' on-screen activities were collected from the interviews. Morae files were not available for six participants because two participants refused to have their on-screen activities recorded and the recordings of four participants failed due to a technical problem.

3.5 Data Analysis Methods

Data from background questionnaires and post-interview questionnaires were entered into Excel and imported into Stata for quantitative analysis. Furthermore, data on questions submitted by participants including topical category selected by participants for each question, the textual content of each question, and the number of answers received for each question were manually mined from the recordings of participants' on-screen activities. This data was entered into Excel and merged with rating data that was also entered into Excel. This merged data was then imported into Stata for quantitative analysis. Descriptive statistical analysis was performed with this data.

Audio-recordings of interview sessions were transcribed and imported into NVivo 10 for qualitative analysis. A codebook was developed both deductively from the interview protocol and inductively as themes emerged from the data. For the sake of space, a simplified version of the codebook is shown in Table 2. For a comprehensive version that includes sample quotes, see Appendix H. It included 24 codes and 67 subcodes that are organized under seven topics, including (1) perception of social Q&A service; (2) use of social Q&A service; (3) goal of social search; (4) expectations for answers; (5) question-formulation strategy; (6) outcome of social search; and (7) credibility assessment.

Table 2: Codebook Used for the Analysis of Interview Data

Topic	Code	Subcode

Topic	Code	Subcode
Perception of social Q&A service	Characteristics	Crowd-Based
		Heterogeneity
		Openness
	Benefit	Saving time and effort
		Connection
		Diversity
	Cost	Uncertainty
		Randomness
		Difficulty
Use of social Q&A service	Collection	
	Secondary source	
	Search for fun	
Goal of social search	Curiosity	
	Decision making	
	School-work help	
	Gaining knowledge	
	Problem solving	
Expectations for answers	Number of answers	
	Characteristic of answer	Experience
		Expertise
	Quality of answer	Specificity
		Diversity
		Novelty
		Comprehensiveness
Question-formulation strategy	Narrow down	Main characteristic
		Focus
		Information type
		Not option
	Contextualize	Demographic information
		Taste
		Familiarity
		Details
		Reason
	Target	Jargon
		Idea in title
	Lower	Open question
		Simple words
	Attract	Brief question
		Structure
Outcome of social search	Informational outcome	Multiple answer
		Comprehensive answer
		Various opinions
		New perspective
		Future reference
		Extra information
		Direction
		Confirmation
		Effective answer
	Social outcome	Good vibe
		Effort
		Attempt
		Needs understood
		Enjoyment
		Responsiveness

Topic	Code	Subcode
		Endorsement
		Limitations
Credibility assessment	Characteristics	Relative
		Crowd-Assisted
		Transient
	Constructs	Pertinence
		Expertise
		Sincerity
		Validity
	Criteria	Applicability
		Novelty
		Diversity
		Experience
		Thoroughness
		Well-Written
		Reputability
		Seriousness
		Niceness
		Effort
		Spam-free
		Source
		Congruence

Chapter 4

Results

This chapter consists of four main sections. The first section provides an overview of the characteristics of the individuals who participated in this study, and of the questions posted by those participants and the answers they received. In the second through the fourth sections, findings are presented for each of the study's research questions, with a summary being provided at the end of each section: (1) What are people's general perceptions of a social Q&A service in terms of characteristics, benefits, and costs, and what are the overall characteristics of their use of a social Q&A service? (2) What are people's specific social search practices when posting questions to a social Q&A service in terms of goals, expectations, question formulation, and outcomes? (3) How do people conceptualize and assess credibility in the process of social search when using a social Q&A service?

4.1 Characteristics of Participants and Questions Collected

4.1.1 Participants

This section describes the characteristics of 78 participants who participated in this study, including their demographics and their prior experience with Yahoo! Answers and other online Q&A services. The data was collected using a background questionnaire which was administered at the end of the introductory meeting.

This study recruited 78 undergraduate students from a research university in the Midwest. Table 3 shows demographic information about the participants, including gender, age, and year in program. Among 78 participants, 36 (46%) were male and 42 (54%) were female. The participants included 26 freshmen (33%), 29 sophomores (37%), 15 juniors (19%), and 8 seniors (10%). They ranged in age from 18 to 24, with a mean age of 20.

Table 3: Participant's Demographic Characteristics (n=78)

Demographic Characteristics	Frequency	Percentage
Gender		
Male	36	46%
Female	42	54%
Class standing		
Freshman	26	33%
Sophomore	29	37%
Junior	15	19%
Senior	8	10%
Age		
18	1	1%
19	20	26%
20	26	34%
21	16	21%
22	10	13%
23	3	4%
24	1	1%
Missing	1	

Table 4 shows information about participants' majors. In terms of undergraduate major, 11 (14%) were undeclared, while those who had declared their majors represented 37 different majors across the university.

Table 5 shows participants' prior experience with Yahoo! Answers, including their Level on Yahoo! Answers and their experience with different activities on Yahoo! Answers. In terms of the Level on Yahoo! Answers, the majority of participants were at relatively lower levels (i.e., Level 1 or Level 2 on a scale of 1 to 7). Specifically, among 78 participants, 67 participants (86%) were Level 1, 8 participants (10%) were Level 2, 2 participants (3%) were Level 3, and 1 participant (1%) was Level 6.

In terms of their experience with different activities on Yahoo! Answers, the majority of participants reported that they had prior experience posting a question to Yahoo! Answers (n=70; 90%), searching existing questions and answers on Yahoo! Answers (n=69; 88%), and browsing existing questions and answers on Yahoo! Answers (n=53; 68%). On the other hand, a relatively smaller number of participants reported that they had prior experience answering a question asked by someone else on Yahoo! Answers (n=30; 38%), rating someone else's answers (n=27; 35%), and following someone else's questions (n=23; 29%). Out of 78 participants, only 4 participants (5%) reported that they had ever commented on someone else's answers.

Table 4: Participants' Majors

Major	Frequency
Actuarial Mathematics	2
Afroamerican and African Studies	1
Anthropology	1
Art History	1
Biochemistry	2
Biomolecular Sciences	1
Biopsychology, Cognition, and Neuroscience	4
Business	16
Cell and Molecular Biology	1
Chemical Engineering	3
Communication Studies	3
Computer Science	7
Creative Writing	1
Earth Science	1
Economics	11
Elementary Teacher Education	1
Engineering	1
English	2
Environmental Engineering	1
German	2
Informatics	3
Information	2
International Studies	4
Linguistics	1
Mathematics	5
Movement Science	3
Music	1
Neuroscience	1
Nuclear Engineering	1
Nursing	1
Philosophy	1
Physics	1
Political Science	3
Psychology	3
Social Theory & Practice	1
Spanish	1
Statistics	1
Undecided	11

Table 5: Participants' Prior Experience with Yahoo! Answers

Variable	Frequency	Percentage
Level on Yahoo! Answers		
Level 1	67	86%
Level 2	8	10%
Level 3	2	3%
Level 6	1	1%

Variable	Frequency	Percentage
Activities on Yahoo! Answers		
Post a question to the site	70	90%
Search existing questions and answers	69	88%
Browse existing questions and answers	53	68%
Answer a question asked by someone else	30	38%
Rate someone else's answers	27	35%
Follow someone else's questions	23	29%
Comment on someone else's answers	4	5%

Table 6 shows participants' prior experience with other online Q&A services. More than half of the participants (n=47; 60%) had prior experience using at least one online Q&A service other than Yahoo! Answers, whereas 31 participants (40%) had no experience with other online Q&A services. The top three Q&A services that participants reported that they had used before were Answers.com (n=35; 45%), StackOverflow (n=13; 17%), and Quora (n=8; 10%).

Table 6: Participants' Prior Experience with Other Online Q&A Services

Online Q&A Service	Frequency	Percentage
Answerbag	1	1%
Answers.com	35	45%
Ask.com	4	5%
Askville	6	8%
Ask Metafilter	1	1%
Baidu Knows	1	1%
Naver Knowledge-iN	1	1%
Quora	8	10%
StackOverflow	13	17%
WikiAnswers	2	3%

Note: WikiAnswers is currently called The Q&A Wiki and is a component of Answers.com.

4.1.2 Questions Collected

This section describes the characteristics of questions that participants posted to Yahoo! Answers for this study and answers they received to these questions. Seventy-eight participants posted a total of 406 questions to Yahoo! Answers. While they were instructed to post five questions over the period of one week, twelve participants posted more than five questions, ranging from six to seven questions. With respect to the context of search episode, two attributes, urgency and familiarity, were collected for each question during the interview in the form of ratings on a scale of 1 to 7 (1 = "not at all" and 7 = "extremely"). "Urgency" referred to how quickly participants needed to find

information, while "familiarity" referred to how familiar participants were with the particular subject matter of the question. The averages of urgency and familiarity for 406 questions were 2.82 and 3.69, respectively. Out of 406 questions, 18 questions (4%) were deleted because no answer arrived within its open period of four days. Among 388 questions that were not deleted at the time of interview, 364 questions (90%) had been answered, while 24 questions (6%) had not received an answer. With regard to the number of answers, participants received 2.74 answers per question on average. Participants asked questions on a wide range of topics, with questions covering 24 out of the 26 topical categories available on Yahoo! Answers. (The unused topics were Environment and Pregnancy & Parenting.) Table 7 shows the number of questions for each topical category.

Table 7: Distribution of Questions by Topical Category (n=406)

Topical Category	Frequency	Percentage
Arts & Humanities	18	4%
Beauty & Style	25	6%
Business & Finance	27	7%
Cars & Transportation	3	1%
Computers & Internet	26	6%
Consumer Electronics	10	2%
Dining Out	5	1%
Education & Reference	50	12%
Entertainment & Music	21	5%
Family & Relationships	5	1%
Food & Drink	18	4%
Games & Recreation	7	2%
Health	34	8%
Home & Garden	6	1%
Local Businesses	2	0%
News & Events	5	1%
Pets	2	0%
Politics & Government	7	2%
Science & Mathematics	25	6%
Social Science	24	6%
Society & Culture	24	6%
Sports	26	6%
Travel	33	8%
Yahoo Products	3	1%

4.2 Perception and Use of Yahoo! Answers

During the interviews, participants were asked to talk about their experience with Yahoo! Answers prior to this study as well as in relation to this study. This included what

types of activities they were engaged in, what kinds of questions they tried to find answers to, and how they viewed Yahoo! Answers as a means to seek information. Participants' responses revealed how they perceived Yahoo! Answers in terms of its characteristics, benefits, and costs, and how these perceptions influenced the way they used it.

4.2.1 Perception of Yahoo! Answers

The analysis of the interview data that captured participants' experience with Yahoo! Answers revealed how they perceived it in terms of characteristics, benefits, and costs. Participants characterized Yahoo! Answers as (1) crowd-based, (2) heterogeneous, and (3) open. They were aware that these three characteristics contribute to not only benefits but also costs associated with using Yahoo! Answers for seeking information. Participants found Yahoo! Answers beneficial because it helps them (1) save time and effort, (2) make connections beyond their social networks, and (3) enjoy the aggregated diversity it offers; on the other hand, they admitted that they also have to deal with (1) uncertainty about receiving answers in a timely manner, (2) randomness in answer quality, and (3) difficulty of credibility assessment.

4.2.1.1 Characteristics of Yahoo! Answers

Three main characteristics of Yahoo! Answers were identified based on participants' experience with it: it is crowd-based, heterogeneous, and open. Participants viewed Yahoo! Answers as a place where they openly interact with a large number of people in the process of asking and answering questions on any topic that they are interested in.

a. Being Crowd-Based

The most commonly mentioned characteristic participants mentioned with respect to Yahoo! Answers was that interactions that take place in this setting involve a large number of people they do not know. Many participants noted that there exist a large number of users who can potentially answer any questions they post. Interestingly, many participants viewed this large number of people as a community, although they did not necessarily have a sense of belonging to it themselves as they were not active users of Yahoo! Answers.

Participants perceived interacting with the crowd as a collaborative process of helping each other and sharing each other's knowledge and experience. For instance, S76 said that Yahoo! Answers is composed of "a community of people who would help each other by answering each other's questions using everyone's own background to help in a different area and then in the same way relying on other people to do that for themselves."

In a similar vein, some participants believed that the act of posting a question to Yahoo! Answers is like looking for people who probably have had experience with or know about the subject of interest among a large number of people. S21 expressed her preference towards the collaborative nature of Yahoo! Answers by comparing it with Pinterest, a social media platform that allows users to share pictures each other. She stated that "Pinterest is kind of similar in my mind… it's not the same thing obviously because it's not pictures, but it's a way of sharing your expertise or knowledge with other people, which I like." This collaboration is not limited to the act of asking and answering questions. Some participants suggested that what other people contribute in many different forms, including questions, answers, and comments, could be useful. For example, S78 argued that Yahoo! Answers is "like a forum where people can build on each other's responses."

A few participants, however, pointed out that on Yahoo! Answers, one's experience depends on the range of answers a person actually receives despite the potentially large number of answerers. S39 stated that he "felt like Yahoo! Answers is very limited in the sense that it's limited to what the answerers' responses are." Similarly, S80 suggested the possibility of not being able to take full advantage of this large number of people when posting a question that requires more detailed responses rather than general ones because those questions lead to "breaking down the population of Yahoo! Answers users who can possibly answer the question."

b. Heterogeneity

Another characteristic of Yahoo! Answers mentioned by participants was that it is heterogeneous in that anyone can not only post questions on anything but also answer those questions. S41 described the topic purview of Yahoo! Answers as "anything" by stating "I would just say anything in general. There's so many categories. I think anyone

could ask any question they want and you could have people answer. And so I really just think anything, like everything."

This heterogeneity appears to have both positive and negative effects on people's experience with Yahoo! Answers. Compared to domain-specific Q&A services such as StackOverflow, Yahoo! Answers provides little or no barrier to entry for people by allowing anyone to ask and answer questions with relatively few restrictions, as many participants confirmed its ease of use. S74 stated that Yahoo! Answers is a "very open community" where there is no "filter or segregation or anything." Considering that it is important for any service that is based on user-generated content to maintain a large user base (Harper et al., 2008; Kim, 2010; Shah et al., 2008), being able to keep attracting new users would matter in the context of Yahoo! Answers as well.

However, some participants realized that credibility cannot be guaranteed in this setting because answers come from random people. For example, S31 stated that those who answer her questions are "not necessarily someone who has the educational background or foundation on the topic." Similarly, S51 suggested that "it's not full of experts, so it's not something that you can use for a research paper."

c. Openness

A few participants identified the fact that all questions and answers are publicly available as one of factors characterizing Yahoo! Answers. S78 pointed the "visibility" aspect of interactions within Yahoo! Answers because "everyone can see each other's answers." Despite this visibility, some participants expressed comfort with engaging in activities on Yahoo! Answers, pointing out that anyone can choose to be anonymous in this setting. This openness along with anonymity seems to reinforce participants' perception of the ease of use by enabling them to have full access to all the information available and feel free to ask any questions they want.

4.2.1.2 Benefits of Yahoo! Answers

Participants found Yahoo! Answers beneficial for various reasons. First, participants favored the convenience of Yahoo! Answers in that it saves them time and effort in the process of seeking information. They also valued the capability of Yahoo! Answers to connect them with a large number of people outside their social networks.

Diversity in answers enabled by this large user base was mentioned as one of the benefits that participants recognized from the use of Yahoo! Answers.

a. Saving Time and Effort

Many participants appreciated being able to save time and effort by using Yahoo! Answers to seek information. First, some participants mentioned that they liked the fact that Yahoo! Answers provides a simple and easy way to ask questions of a large number of people. S48 stated that "it's basically having so much information at my fingers whenever I need it." In a similar vein, a few participants indicated that what they liked about Yahoo! Answers is that they did not have to "worry about doing the work" themselves as there were people who would "do the work on behalf of" them once they posted a question.

For some participants, convenience came from the fact that they could use Yahoo! Answers as an easy reference. They pointed out that there was not necessarily a need to post a question themselves, as a lot of their questions were already answered, and in many cases they could easily find answers to their question immediately by looking up existing questions and answers. For instance, S27 said that "It's a quick, easy-to-find … like a lot of questions have been asked on Yahoo! Answers, so you're probably going to find it."

Some participants also stated that they could save time and effort because Yahoo! Answers allowed them to access diverse information in one place instead of going to multiple sites themselves to obtain information thanks to its large user base. In a similar vein, a few participants admitted that answers provided by unknown people sometimes offered them an opportunity to obtain authentic or unique information that they would not otherwise have found themselves. S16, for example, argued that "it could be a source that you wouldn't have found normally on the Internet, given how many websites there are of various credibility and of various places that you could find the website."

Lastly, some participants found it valuable that they could receive information that had been filtered by someone else. Participants elaborated that as a result of this filtering, information they obtained tended to be more concise, and it was written in someone else's word so that it required less effort for them to process it. S69 stated that "you don't get all the newspaper articles … you get a more condensed version." S37

explained how Yahoo! Answers could save him time and effort by comparing it with Google, saying that "Google filters their own way, but as a user of Google, you also filter what they give you again" to find an answer to your question among a large volume of information obtained from Google. Similarly, S55 asserted that "it's like a quicker version of Google because instead of links, you just get people answering what they think."

b. Connecting beyond Network

A number of participants found Yahoo! Answers valuable in that it provides them with an opportunity to connect with people who are not in their social network. Specifically, when there was no one in their social network who could answer their questions, participants took advantage of the huge user base of Yahoo! Answers to find the answer to their questions by posting those questions. S28 stated that "the people around you don't know about this, but somewhere else there is someone that does and Yahoo! Answers is an easy way to reach them." In a similar vein, S37 noted that depending on the kinds of questions, he would be more likely to obtain better answers by asking strangers on Yahoo! Answers than by asking people he knew.

Some participants argued that this is not only about being connected to people who have knowledge about the subject of interest, but finding people around the world who have gone through experiences similar to or same as theirs. Having people who share the same experiences answer their questions tends to result in quality answers because the answers are more likely to relate to those who ask the questions, as S17 indicated. S57 even suggested that "it's a way of tapping into kind of the human capital resource … and experiences that they've had that you wouldn't necessarily have contact with like you couldn't ask them face-to-face."

Furthermore, a few participants reported that they enjoyed the experience of getting feedback from people that were not in their own cultural boundaries as they could obtain new perspectives. For example, S53 mentioned that "it's interesting to hear from people who are not at all—who don't know me at all and who aren't from the same place I am" because it enables her to be exposed to different ways of thinking. Similarly, S40 stated that "I only know a certain amount of people … because all my friends are students and we basically know the same things and share the same perspectives and we're pretty

similar … there are people who are really different from me and their answers could be really amusing to look at."

c. Aggregated Diversity

Diversity of answers was another benefit that participants mentioned. They viewed Yahoo! Answers as being valuable because they could receive multiple answers from a large number of people who would potentially have different perspectives. Participants also preferred an answer that contained multiple options. Since Yahoo! Answers has a large user base, it is likely that there exist a variety of people who have knowledge about or experience with the chosen subject, and thus those who ask the questions are likely to obtain a few different answers.

Moreover, a few participants mentioned the possibility that every person who looks at the question interprets it differently to some extent, and perceived this as an opportunity to make an unexpected discovery. S41 explained that "it's just having a different look to your question," implying the potential benefit of different interpretations of the question. For instance, those who answer questions may provide information that is not necessarily directly pertinent to the question, consequently offering a new perspective that the asker may have not considered before. It appears that when it comes to diversity, it goes beyond receiving a variety of answers to the question, and is more closely related to value-added aspects such as interestingness and unexpectedness.

4.2.1.3 Costs of Yahoo! Answers

Participants mentioned several costs that they experienced when using Yahoo! Answers as a resource for seeking information. Three aspects were identified as costs of it: uncertainty in receiving answers to their questions in a timely manner, randomness in terms of answer quality, and difficulty associated with credibility assessment.

a. Uncertainty about Receiving Answers in a Timely Manner

Participants were fully aware that there is no guarantee in terms of the likelihood and timeliness of getting answers. Many participants described Yahoo! Answers as "hit or miss," acknowledging the uncertainty around the ability of receiving answers to their questions. S65 stated that "it's not a place to necessarily get all your questions answered."

Furthermore, some participants noticed that there were differences in the likelihood and timeliness of getting answers depending on the types of questions they asked and categories they selected for their questions. S26 noted that "it appears some questions do get a lot of answers compared to the others." This is in line with findings from prior work that has shown the inherently heterogeneous nature of Yahoo! Answers by analyzing behavioral patterns based on a large data set of question-answer pairs (Adamic et al., 2008).

Although they understood that there is uncertainty in terms of the timeliness of getting answers, some participants admitted that they felt frustrated when they did not receive any answers at all. In addition, not only the likelihood of getting answers, but also whether answers arrived in a timely manner mattered. Specifically, some participants indicated that getting an answer is one thing and getting a quality answer is another. S19 explained that "it could take 10 minutes, but it could take two days to get the really good answer that you want. And sometimes you just don't have time for that." Similarly, S20 voiced his frustration, saying that "I never realized how difficult it was to get a real answer to some of these questions because I didn't think some of the questions I asked were that hard."

Such experiences of frustration seemed to make people avoid asking questions that were urgent and led them to prefer searching through existing questions and answers rather than posting their own questions. For instance, S55 thought that "it's easier to just look through other answers and other people's questions. Because … for some questions you don't get as many answers as you want to."

b. Randomness in Answer Quality

Another cost mentioned by many participants was randomness in the quality of answers they receive. Participants recognized that answers vary in quality because they come from random people who are not necessarily experts in the subject of interest. They also indicated that, like in any other online setting, on Yahoo! Answers there exist some people who are trolling in addition to people who are well-intentioned, and this contributes to variability in answer quality. A few participants mentioned variability in quality based on categories they used in the question in as well. For example, S07 said that "like that was something people are really passionate about so that's why I got a lot

of responses and a lot of really thorough descriptions about it, whereas something like troubleshooting, people usually aren't very passionate about fixing computer problems."

Since participants were aware of this randomness in answer quality, they believed that they had to take additional steps to address the issue of credibility of the answers they received, and of the credibility of the people who provided those answers. S08 stated that "it's not necessarily always credible … you always have to back it up with other resources." In a similar vein, S19 argued that "it can be anybody giving you an answer so you have to check the validity of the source a little bit."

c. Difficulty of Credibility Assessment

It is no surprise that participants found it difficult to assess the credibility of answers and of those who answer questions on Yahoo! Answers considering that the content of the site is user-generated. Many participants signaled their frustration when describing how difficult it was for them to evaluate the credibility of answers they received. S72 stated that "you can't always verify that somebody's credible, even though I clearly have my steps to doing so, it's not always a fool-proof system." Some participants complained about the lack of available cues that they could use for credibility assessment. For instance, S32 said that "you only have someone's name and there is not always a lot of ways to check their credibility." Similarly, S44 indicated that "the credibility is very limited to what you believe [about] what the user profile [shows]."

To deal with this issue, a few participants claimed that they felt they would be better off if they asked questions on subjects they already had a certain level of knowledge about. They believed that being familiar with the subject to some extent would help them better assess credibility in this setting that offers very limited cues.

4.2.2 Use of Yahoo! Answers in the Information-Seeking Process

When asked about how they used Yahoo! Answers in the process of seeking information, most participants reported that most times Yahoo! Answers was not their first choice. Participants used the service both actively and passively by posting their own questions and searching a collection of accumulated questions and answers. However, they tended to prefer searching a collection of questions and answers over posting their own questions for various reasons. Interestingly, some participants mentioned that

enjoyment was sometimes their primary goal in using Yahoo! Answers, not getting the answer to their question.

4.2.2.1 Yahoo! Answers as a Secondary Search System

Most participants indicated that Yahoo! Answers was rarely used as their primary resource to seek information, especially when they looked for credible information. Specifically, they reported that they would post a question to Yahoo! Answers when they could not find the answer to their question using other means, including conducting search using search engines or asking the question of people they know.

One of the reasons that participants mentioned for not using Yahoo! Answers as their primary resource was that they could find information faster through "Googling." For example, S59 explained that "when you ask a question, even if they answer you in five minutes, that's pretty fast, but on Google you can get an answer in five seconds, which is why I think it's not a bad way to do things, but it's a little slower." In a similar vein, S63 stated that "sometime it can take a little bit more work" if he uses Yahoo! Answers because he has to wait until someone answers his question and even go to other websites if that person just provides links with little description.

The fact that participants turned to Yahoo! Answers when they failed to find the answer to their question by using other online or offline resources indicates that consequently certain types of questions are more likely to be asked on Yahoo! Answers. People come to Yahoo! Answers in order to take advantage of a huge potential audience, with the expectation that there may be someone among a large number of people using Yahoo! Answers who might know the answer to their question. Therefore, questions that participants asked on Yahoo! Answers were usually ones for which it was relatively hard to find the answer on the pages of search results. For example, questions on a very unpopular topic or a more obscure topic are more likely to be asked, as S65 and S78 indicated.

With regard to the nature of questions that participants posted to Yahoo! Answers, three main characteristics were identified: non-critical, out of curiosity, and specific. Many participants stated that they would not depend on responses from Yahoo! Answers if they wanted to obtain information immediately, as they were aware that it might take some time to receive a satisfactory answer. S21 said that "usually I don't use it for

questions that are incredibly urgent because it's more just the kind of thing where you ask a question and then wait for the stuff to come in."

For some participants, how consequential the answer would be seemed to matter when they decided whether or not to post a question to Yahoo! Answers. S63, for example, asserted that he would post a question to Yahoo! Answers only if the situation was not too serious, so that "your life won't be destroyed or you won't have a lot of problems that you have to deal with" as a result of the answer you received.

Some participants mentioned that many questions were random questions that were asked out of curiosity. Such curiosity-based questions tended to be spontaneous and "pop into their heads" while they were watching TV or having a conversation with their friends, according to S20 and S58. Questions that were specific to participants' personal circumstances and that required opinions of other people were also one of the common types of questions participants posted to Yahoo! Answers. S57 suggested that Yahoo! Answers works well when "you have a more personalized question for something that you're experiencing that someone else who may have experienced the same thing is likely to come across and be able to give you firsthand an account of what they did and what worked for them."

While most participants indicated that they use Yahoo! Answers as a secondary resource, a few participants reported that Yahoo! Answers could be their first choice in some cases. Specifically, they elaborated that they turn to Yahoo! Answers first if they are not sure where to start due to having little or no knowledge about the subject, or if they want to obtain a quick overview of the topic. They argued that such an initial search using Yahoo! Answers helps them refine their subsequent searches using other resources by providing guidance.

4.2.2.2 Yahoo! Answers as a Collection of Questions and Answers

Nearly all participants said that they usually searched a collection of accumulated questions and answers instead of posting a question themselves. They viewed Yahoo! Answers as a huge collection of people's thoughts about any topic and to some extent they used it in a similar way to the way they used Google.

With regard to reasons that they tended to search the archived collection of questions and answers rather than posting their own questions, many participants argued

that they did not feel a need to ask a question as their questions were likely to have been asked by someone else and answered already. In fact, a large number of participants mentioned that in many cases they came to Yahoo! Answers through Google because links to the Yahoo! Answers questions that were same as or similar to their questions appeared as one of top search results when they conducted a search. Thus, they felt that posting the same question again would be a waste of their time and effort. A few participants also shared their experiences of encountering a number of iterations of the same exact question when they typed in their questions.

Many participants mentioned the fact that there was no guarantee that answers would arrive in a timely matter or would arrive at all in the first place as the reason that they preferred looking up responses to questions that other people had posted. For example, S50 stated that "I would rather look at that than have to wait for someone else to respond." A few participants also said they felt that they were more likely to find more and better answers when they looked up existing questions compared to the quality of answers they actually received when they posted their own questions.

Some participants found searching for existing questions more valuable in that it provided them with an opportunity to compare multiple similar questions. When they looked up existing questions that had already been answered, there were usually multiple answers to each question. By comparing these answers, participants were efficiently able to obtain quality answers to their questions. A few participants reported that they especially paid more attention to answers that other users had chosen as best answers because they considered that a proxy for quality.

A number of participants reported that they often looked up existing questions in order to seek information to answer school-related questions. Specifically, they appeared to find Yahoo! Answers useful for doing a fact-check on their homework, such as answers to math questions, or for obtaining information in a summary form for their papers in a relatively easy manner. For instance, S63 explained that he used Yahoo! Answers to "get a general idea of something … because it can present things in a very summary-esque way."

Interestingly, those who used Yahoo! Answers to get an overview of a particular subject perceived Yahoo! Answers to be similar to Wikipedia to some extent in that they

could refer to Yahoo! Answers to get ideas, but could not cite it as a formal source in their academic work. S60 called Yahoo! Answers a "really crappy version of Wikipedia."

4.2.2.3 Yahoo! Answers as a Setting for Searching for Fun

It seems that participants did not use Yahoo! Answers only as a means to find answers to their specific questions. For some participants, it was a setting where they conduct searches for entertainment, without a particular goal of getting a good answer to their question, mainly asking random daily questions or browsing questions posted by other people. As discussed in the previous section, participants sometimes posted questions to Yahoo! Answers just out of curiosity. In such cases, they appeared not to expect high quality and trustworthy answers because they believed that credibility did not matter much for the questions they asked.

A few participants also stated that they found it interesting to browse and read questions that other posted. S45 said that she likes to "scroll through other people's questions … because some people ask some funny stuff." Interestingly, those who sometimes browse other people's questions rarely answer those questions. Similarly, S28 stated that he sometimes looks up "outrageous questions or things that interest" him, browsing on Yahoo! Answers. S37 also indicated that he sometime reads questions that Yahoo! Answers shows on the side when he types in his question if he sees something that "piques his interest."

Browsing other people's questions just for fun may lead to an unexpected discovery of information or initiation of a new search by stimulating participants' curiosity. For example, S69 reported that she feels sometimes that "this might actually lead somewhere" when she browses through the questions.

4.2.3 Summary

With regard to the general perception of Yahoo! Answers, participants viewed it as a place where they openly interacted with a large number of people through asking and answering questions on any topic that they were interested in. Moreover, participants found Yahoo! Answers beneficial because it enabled them to save time and effort, to connect themselves with a large number of people outside their social network, and to obtain diverse information in one place. At the same time, participants were fully aware

that using it as an information source entailed several costs. They recognized that there was no guarantee in terms of the likelihood and timeliness of getting answers to their questions, and that answers varied in quality. They also acknowledged difficulty associated with assessing information credibility within Yahoo! Answers.

Findings from this study also provided insights into people's use of Yahoo! Answers in general. People tended to use it as a secondary information source, not a primary source. Moreover, many participants preferred searching a collection of questions and answers instead of posting their own questions to find information. This study also found that some participants used Yahoo! Answers for entertainment, without the specific goal of getting answers to their questions, by mostly asking random questions or browsing questions posted by other people.

4.3 Social Search Using Yahoo! Answers

This section presents the results regarding people's social search practices in the Yahoo! Answers setting. How can information seeking using Yahoo! Answers be characterized in terms of various dimensions including search goals, expectations, strategies, and outcomes? Identifying the characteristics of these dimensions allows us to better understand how people actually utilize a social Q&A service as a venue for social search and what they gain in this process as a result.

4.3.1 Goals

Goals have been found to be fundamental factor in understanding people's information seeking behavior (Xie, 2000). Therefore, as the first step in examining how participants actually used Yahoo! Answers as a venue for social search, their goals were identified. During the interview, participants were asked to talk about what they were looking for and why they needed that information for each search episode that was associated with their question. The analysis of this interview data revealed that participants used Yahoo! Answers to satisfy a variety of goals. Specifically, by posting their questions to Yahoo! Answers, they hoped to get answers that would aid them in achieving the following: (1) satisfy curiosity, (2) make a decision, (3) receive help with school-related work, (4) gain knowledge or skill for personal development, and (5) solve a problem.

While previous work has mostly looked at types of information needs or types of questions by analyzing the texts of questions crawled from social Q&A services (Adamic et al, 2008; Harper et al., 2009; Nam et al., 2009), this study focused on identifying the types of goals participants hoped to achieve in order to capture a more nuanced understanding of the contexts that lead to the use of a social Q&A service. Furthermore, this study took statements of those who actually posted questions to Yahoo! Answers into account, as well as both the text of questions and additional details optionally provided by participants in identifying their goals. Table 8 shows the frequency and percentage of each type of goal along with several example questions selected from a total of 406 questions that participants posted to Yahoo! Answers for this study.

Table 8: Goals of Social Search Using Yahoo! Answers (n=406)

Types of Goals	Frequency	Percentage	Example Questions
To satisfy curiosity	125	31%	What cities are up for nomination for the 2022 Winter Olympics? Why is this winter so cold? Are Manchester United and Real Madrid coming to Michigan this year?
To make a decision	77	19%	Being president of your fraternity...? What to do in Cabo San Lucas on a Spring Break trip? What is a good entry level road bike under $300?
To receive help with school-related work	72	18%	Can someone explain alpha decay vs. beta decay? What is an interesting stock to write a report on for class? How do i find equations for all lines through the origin tangent to the graph f(x) = -x^2 + 6x - 8?
To gain knowledge or skill for personal development	71	17%	How can I expand my vocal range? What careers does a sociology degree prepare you for? How can I run longer distances? I keep running for 1.5 miles but my distance just doesn't seem to increase?
To solve a problem	61	15%	No Internet Access for a Weekend? What should I do to get rid of bruises quick? How to care for a bamboo plant?

The most common type of goal that participants tried to achieve when using Yahoo! Answers for seeking information was to satisfy curiosity (n=125; 31%). A large number of participants posted questions to Yahoo! Answers because they were just interested in knowing. While curiosity was often motivated unexpectedly by a wide range of daily activities such as classes, conversation with friends or family members, and consumption of TV shows or news articles, it was sometimes triggered by participants' long-held interests. For example, S03 explained that "in my Arab-Israeli Conflict class, we were talking about refugees and people in exodus and so I was just curious to elaborate a little bit more." In a similar vein, S74 stated that "me and a Catholic friend of mine were actually talking about this and he really didn't know or couldn't give me a good answer, so we were all just curious, so I decided to use this."

The second most common type of goal, decision making, led many participants to post questions to get other people's opinions to help them decide what to do (n=77; 19%). Decision making involved a wide range of situations including personal matters, shopping, travel, and eating out. S67, for instance, stated that "my friend and I … have been thinking about fostering a cat and … we wanted to know if anyone had experience with that." S56, who planned a trip to L.A. for spring break for the first time in her life, said she wanted to see if "other people had some ideas about what to do or see."

Many participants also used Yahoo! Answers to receive help with their school-related work such as homework questions, test preparation, research paper assignments, and extracurricular activities (n=72; 18%). While some wanted to find definite answers to their homework questions or test questions by copying and pasting the question and posting it to Yahoo! Answers, there were others who turned to Yahoo! Answers to get an idea for a paper or to better understand concepts that they had learned during the class. S51 explained that she wanted to know about "language quirks" in a particular place in England as she was "writing a short story for a class … and it was set in a particular place in England and there was a lot of dialog that I wanted to use." S13 said of her question that "it was a confusion I had from one of my math classes and the reason I posted the question was the answer my professor gave was not satisfactory and so I went ahead and posted it online."

Gaining knowledge or skill for personal development was one of the goals that participants wanted to achieve by seeking information using Yahoo! Answers (n=71; 17%). Participants' interest in personal development covered a wide range of topics, including learning or improving new skills, gaining knowledge for future career development, and obtaining know-how about health management or time management. S39 explained that "Recently I have gotten hooked onto rock climbing … what I wanted to ask people, like just a general audience, was just any techniques that I could work on to make it better or improve my skill, just to be a better climber." Along similar lines, S48 stated that she was "trying to find books or movies that I could possibly [try] while I'm on breaks … I really love books but I have lost track because there's a lot going on with school and I like movies, too."

Some participants used Yahoo! Answers in order to solve a problem at hand by reaching out to a large number of people to find a solution (n=61; 15%). Problems that participants had appeared to be relatively non-serious and to be related to their daily lives in that they dealt with issues such as beauty, housekeeping, or computers. S11, for example, said "I have these shoes that are not all that waterproof, so I just wanted to find the best way to treat them." S69, whose laptop was stolen at a library, stated that "I figured maybe someone knew or someone had gone through the same thing whether it be here or somewhere else or maybe they know."

Table 9 shows a comparison of attributes of search episodes by search goal in terms of urgency and familiarity. While there existed no significant difference in participants' familiarity with the subject of the question (p=0.652) depending on goal type, urgency (p=0.000) was found to be significantly different according to goal type. Participants felt the most urgency regarding questions they posted in order to receive help for school-related work, followed by questions posted to solve a problem, and felt the least urgency when they posted questions out of curiosity.

Table 9: Search Episode Attributes by Social Search Goal (n=406)

Types of Goals		**Urgency**	**Familiarity**
	n	***M (SD)***	***M (SD)***
To satisfy curiosity	125	1.64 (1.00)	3.56 (1.68)
To make a decision	77	3.12 (1.51)	3.77 (1.61)

Types of Goals		Urgency	Familiarity
To receive help with school-related work	72	4.08 (1.81)	3.92 (1.65)
To gain knowledge or skill for personal development	71	2.49 (1.53)	3.72 (1.76)
To solve a problem	61	3.77 (1.84)	3.56 (2.04)
Total	406	2.82 (1.76)	3.69 (1.73)

4.3.2 Expectations for Answers

To get a holistic view of social search practices using Yahoo! Answers, participants' expectations about the answers they sought when they posted their questions were examined. Their expectations about the answers are analyzed below in terms of three aspects: quantity, basis, and quality of answers. Quantity of answers looks at people's expectations regarding the number of answers they would receive. The basis for answers refers to people's expectations regarding the source of knowledge that can be captured based on what is said in the answer. The quality of answers addresses people's expectations regarding goodness of the answer.

4.3.2.1 Quantity of Answers

Nearly all participants had high expectations regarding the number of answers they would receive. A large number of participants expressed disappointment with the fact that the number of responses they actually received was much smaller than they originally expected. This expectation for a greater number of answers was based on a variety of assumptions that participants had around experience, interest, and ability of potential answerers, as they were aware that there existed a large number of people who might answer their question.

Some participants assumed that there would be many people who were qualified to answer the question because they asked a general question that a lot of people would relate to or have experience with. S10, for example, stated that "I think basically it will have a higher possibility that more people can answer this question because it's about New York City or a lot of tourists also can tell me about it." Similarly, S49 indicated her disappointment with a small number of answers she received, saying "I mean I bet there are a lot of people that read books, so I don't know why only two people answered."

The belief that there would be a large number of people who would be interested in the subject and thus would be inclined to answer the question was also mentioned. S53 explained that she had high expectations "because people sometimes like to share their tastes in music." S68's perception of the topic of "Diet and Fitness" conveyed a similar sentiment, saying that "Like 'Diet and Fitness' are one of those things that I feel like people are really active on the Internet about. So just I expected more people to be interested in having their say in somebody else's life about." Along these same lines, S77 indicated that "it's a very hot topic, I suppose. Like it's a big debate of modern times so I'm thinking more people weigh in soon and give me their opinions."

Another reason mentioned for high expectations regarding the number of answers was the ease of the questions participants posted. S23 said, "I don't think it was a very confusing type of question. I thought it was straightforward." S40 stated that "I think that's a pretty easy question and a lot of people can answer that."

While most participants expected to receive a large number of answers, a few participants acknowledged that there would be a smaller audience for their questions despite the huge user base of Yahoo! Answers because their questions were very specific or dealt with non-popular topics. S54, who asked a question about a baseball team, the Braves, noted that "It's just pretty much only people who are Braves fans who are also on Yahoo! Answers who are also interested in following baseball in February, which is pretty much narrowing the domain down a lot." S68 suggested that he did not expect many responses to his question on summer internship because "it's not as interesting as family drama might be and fewer people are also qualified to say stuff about that." In a similar vein, S72 explained that she expected that her question would not get many answers "mostly because I mean Yahoo! Answers is not a specifically Jewish thing … there are a lot of knowledgeable people on Yahoo! Answers, but not specifically about the things I was asking about necessarily."

4.3.2.2 Basis for Answers

Some participants held expectations that answers would clearly indicate that those who answered the question had experience with or expertise about the subject of interest.

They appeared to consider answers that were based on either experience or expertise as a sign that answerers were knowledgeable about the subject.

a. Experience-Based

Some participants expected to see firsthand accounts from people who had been in the same situation as them or who had done something that they themselves had no experience. S47, who asked a question regarding her health condition, noted that she hoped to "see if someone could provide me with their own experience if they have gone through these similar symptoms like what the doctor has told them or if there was a specific diagnosis that they got." Similarly, when asked about expectations for responses to a question about her future career, S51 indicated that "I was really hoping to get somebody who went into library sciences or was a librarian or knew someone who went into library sciences and could kind of explain in a very conversational way what it was."

b. Expertise-Based

On the other hand, a few participants expected to receive answers from experts even though they understood that Yahoo! Answers users were not necessarily experts in any domain. S02 reported that she was hoping that "someone was a lawyer and just explained it in plain English," when she posted a question asking whether it was legal for one party to record a conversation without telling the other. S37 stated that he expected to get answers from "professional memory athletes" in order to learn about resources that would help him improve his memory.

4.3.2.3 Quality of Answers

With respect to quality of answers, it was found that the following four elements of quality were expected by participants: (1) specificity, (2) comprehensibility, (3) diversity, and (4) novelty. The first two elements, specificity and comprehensibility, relate to the fact that answers come from real people, while the remaining two elements, diversity and novelty, relate to the fact that there potentially exists a large number of people that might answer the question.

a. Specificity

Some participants hoped to receive answers that would include concrete information such as examples or links that they actually could use instead of abstract or vague ones, given that real people would read their questions and provide tailored answers. S62, for example, stated that she expected people to give her "a couple of questions really to start … understanding what the interview process is like" when she asked a question about med school interviews. In a similar vein, S65 who posted a question regarding the leading figures in the cognitive revolution, said "I was hoping for a list of people and I guess maybe their major contribution next to it." S70 also expected that "people would say local bars," when she asked for a good place to go on St. Patrick's Day.

b. Comprehensibility

A few participants pointed out that answers would be likely to be easier for them to understand compared to materials they might get through a Google search because the answers were written in someone's everyday words. For instance, S40 explained the reason that she believed that answers coming from Yahoo! Answers users would be more comprehensible, stating "I think it's from another person … the words he or she uses might be more everyday language and easier to understand." Similarly, S56 said "I guess just expecting someone to kind of in layman's terms describe exactly what it is."

c. Diversity

A few participants expected diversity in answers that could come from either a large number of answers that represented different opinions or from an answer that contained multiple options, considering the huge user base of Yahoo! Answers. S26, who wanted to obtain information on airport shuttle services, stated her preference for answers with multiple options, saying that "I do want some suggestions. So if that first suggestion doesn't work out, I can move onto the second one and I have options to choose." Similarly, S80 indicated that he expected "a mix between the popular tourist spots versus some of the lesser known places to go or visit or eat at" when he posted a question asking for advice on working in China.

d. Novelty

Those who viewed posting a question to Yahoo! Answers as a way to tap into the power of the crowd expected to receive answers that would contain information that they had not heard of before. It seems that some participants hoped that the uniqueness of information that each answerer might bring could be transformed into novelty for themselves. S41, who wanted to find websites that sold cute and affordable clothes, reported that she expected people to tell her about "unique places" rather than "the general ones" that she already knew about. Similarly, S56 mentioned that she hoped for "some other under the radar things that weren't as familiar or … touristy things" when she asked what to do in Los Angeles. S33 also indicated that he expected "some other games that maybe I haven't heard of before" when he posted a question about games that one could play in travel vans.

4.3.3 Question Formulation

In examining people's social search practices in the Yahoo! Answers setting, it is important to understand how they explain what they are looking for to potential answerers because those answerers are random strangers whom the askers do not know, and this makes it much harder to get a sense of audience they are interacting with. Prior work, mostly experimental, that has examined the effect of the way people write questions on the quality and/or quantity of answers in social Q&A and SNS settings shows mixed findings (Harper et al., 2008; Morris et al., 2010b; Nichols & Kang, 2012; Teevan, Morris, & Panovich, 2011; Yang et al., 2010). However, what specific strategies people actually use to convey their needs in a social Q&A setting has not been studied previously. Thus, the strategies and tactics used to formulate questions was examined in this study.

4.3.3.1 Strategies and Tactics

By adopting the definitions suggested by Bates (1979), this study defined "strategies" as the asker's plan with respect to the direction of question formulation, while "tactics" referred to specific moves the asker made in the intended direction of question formulation. As discussed earlier, participants fully understood that there was uncertainty about the likelihood of getting answers and variance in the quality of answers

despite the fact that Yahoo! Answers has a huge user base. Therefore, they took both the quantity and quality of answers into account when formulating questions, with an emphasis on striking a balance between them considering the circumstances of each search episode. For example, S01 stated that "your question can't be too vague … they'll ask you the question, "Could you explain more?" and that doesn't really help. But you shouldn't give too much away because that's not very good."

Participants wanted their questions to be broad so that more people would be inclined to answer them. However, at the same time, they did not want the questions to be too broad to allow them to receive good and relevant answers. S68, who had been using Yahoo! Answers for a long time, explained why asking a specific question is important in Yahoo! Answers. He argued that "if you don't provide enough background information, your question is left up to people's interpretation and their interpretation can be way off from what you actually want to be answered or leaving out details that you expected to have answered but didn't mention. So I feel it's necessary to ask the question in a way that's succinct and then provide the backstory of whatever if it's necessary."

It was indeed found that participants used different strategies and tactics depending on whether they prioritized the quantity or the quality of answers. Specifically, in order to increase the chance of getting answers and the number of answers they would receive, participants employed strategies of lowering barriers for potential answerers and attracting the attention of potential answerers. On the other hand, to increase the likelihood of receiving high quality answers that were pertinent to their questions, participants used strategies of narrowing down options that could be considered, contextualizing their questions by providing additional information along with the questions, and targeting the specific audience that they assumed to be qualified to answer them. Table 10 below shows question-formulation strategies and specific tactics associated with each strategy that was identified.

Table 10: Question-Formulation Strategies and Tactics

	Strategies	**Tactics**
Answer-Quantity oriented	Lower barriers for potential answerers	Leave a question open Use simple words in a question

	Strategies	Tactics
	Attract attention of potential answerers	Make a question brief Structure a question in a reader-friendly style
Answer-Quality oriented	Narrow down options	Provide main characteristics or aspects of what the asker is looking for Explain the focus that the asker is looking for Indicate the type of information the asker wants Describe what is not an option for the asker
	Contextualize a question	Provide demographics Indicate the asker's taste Describe the asker's familiarity with the subject Include a detailed description of the problem Explain why the asker is asking the question
	Target specific audience	Use jargon in a question Put a title with main ideas in a question section

4.3.3.1.1 Answer-Quantity Oriented Strategies

a. Lower barriers for potential answerers

Participants tried to lower barriers for potential answerers in order to increase the chance of getting answers and the number of answers they would receive. Several tactics used to lower barriers were identified. First, some participants left a question open, including few or no restrictions, in order for potential answerers to feel more inclined to answer their questions. S04 explained that the reason that she left her question open was "so people could interpret it their own ways and get their answers." She additionally mentioned that "I feel like sometimes if you make your questions too specific, people don't want to answer it because they think it's too challenging." In a similar vein, S44 stated that he changed his strategy of making a question specific based on experience with other questions he had posted previously. He explained that "in the first question when I didn't get any answers, I guess it was too specific, so I wanted to make it kind of broad."

Some tried to use simple words in their questions in the hope that potential answerers would better understand what they were talking about and would be willing to answer their questions. For example, S69 made sure that people understood what "NCOB" means by spelling it out as "No Child Left Behind." S36 also noted that he refrained from using the word "dexterity" in his question because he felt that "a lot of people didn't understand what I was trying to get at." Instead, he asked a simple question, "How can I run longer distances?"

b. Attract attention of potential answerers

Some participants emphasized the importance of attracting the attention of potential answerers because there were too many questions waiting for responses. To attract the attention of potential answerers, participants believed that a question should be easy to spot.

A few tried to make their questions easy to spot by writing brief ones. Based on his experience, S16 explained that "I kind of noticed that the questions are more simple and straightforward pretty much in the least words got answered more often. Like one of the questions, it was kind of a little bit of an explanation and a little just more in detail in the question and I just feel like it didn't get recognized as much as the ones that are very short and straightforward." Similarly, S53 reported that "I thought that it should be just really straightforward so someone could just look at it and they wouldn't have to go through a whole line of stuff to feel like they could answer it." S02 also indicated her preference for a briefer question, stating "I didn't want to write too long of a paragraph because I feel like no one would bother to read it then."

People also reported that they paid attention to the structure of their question in order to make their questions more scannable and readable. Specifically, they put a general and relatively shorter question in the question section, and included details in the additional details section. S60 argued that "I didn't think it was wise to type that much in the actual title, so I just brought it down to the bottom." Similarly, S61 stated that "the question is just kind of an eye grabber, but the real question is in the details." Moreover, a few people organized their questions so that there were several sub-questions within one question to enhance readability. For example, S37 stated that "I kind of broke up the question in two. So one is: How can I expand my vocal range? And then a follow up

question would be: What are some exercises that help in transitioning between vocal registers?"

It is noted that a very small number of participants reported that they updated their original questions based on feedback from the answers they received in order to clarify what they were looking for or what their situation looked like. S33 mentioned that he included what he exactly meant by 'the best' in the question after one of the answers requested clarification. Similarly, S67 said "two of the people who answered had mentioned that you shouldn't do it freshman year, so I wanted to clarify that we're not freshmen because I felt like that might change people's answers."

4.3.3.1.2 Answer-Quality Oriented Strategies

a. Narrow down options

One of the strategies that participants used to ensure quality answers was to narrow down options by adding conditions to their questions. They believed that by doing so they could help those who would answer their questions better identify what they wanted. A variety of tactics were implemented to narrow down options. First, participants provided the main characteristics or aspects of what they were looking for when they wrote a question as one means to specify what they wanted. S67 indicated that "I added the 'ones that are nice, but not too expensive' because I know that narrows it down some and then I wanted to write for a 'date night' specifically because that gets a bit different response than just for a group or for other things." In a similar vein, S09 stated that "I wanted to know how it was different, so that's why I put that 'how they differ'."

Some narrowed down options by explaining what they focused on in their questions, allowing them to specify what specific sub-topic they were interested in within the topic of the question. For example, S47 described putting the word "chemicals" in her question because she hoped that "people would be like, 'Oh, I see she's trying to ask specifically about the chemicals within the water.'" S54, similarly, explained that "When I wrote 'young starters,' I wanted to kind of focus it on people who are already on the team as opposed to other questions which would maybe imply people to respond with saying they should sign someone else."

Explicitly indicating the type of information they were looking for was another tactic participants implemented to make sure that they would receive pertinent answers. S24, for instance, said that he chose to use the word "website" instead of saying "What is a good internship in Chicago?." Similarly, S53 stated that "I put in the extra description 'just looking for opinions' just so people would know kind of what I was looking for." S21 also explained that "I did specifically say that I wanted home remedies because I wasn't looking for a product that I would go out and buy specifically."

Moreover, some participants included information about not only what they were looking for but also what they were not looking for to narrow down the answers. By describing what was not an option for them, participants believed that they could avoid receiving information not pertinent to their questions. For example, S12 explained the reason why he included a certain phrase at the end of his question as follows: "I kind of thought a lot about the last phrase of that, 'without joining a fraternity' and whether it was necessary. But I didn't want someone to say, 'Oh, join a fraternity' and then it's like, 'That answer wasn't that helpful for me.' So this phrase was just something I thought about."

b. Contextualize a question

To make their questions more explicit, participants provided background information about not only themselves but also their situation. They thought such detailed information would help potential answerers have a better sense of who the asker was and what was going on, and to provide more specific answers to their questions.

One tactic used to contextualize a question was to provide demographic information such as age or educational level. S06 stated that "I thought maybe including my status as a college student, my age, it might give a rough idea of, 'Oh, yeah, I notice that typically college students wear this type of watch' or as versus to a business man or a blue collar worker or anything like that."

Some participants indicated their taste in the question to help answerers understand who they were. For example, S05 said " I gave them examples of what I usually drink so that will kind of give them an idea of what I like, so hopefully that they would cater to that when they told me suggestions." Similarly, S49 stated that "I told

people what I had read … I guess I wanted them to see what kind of books I am interested in so they can suggest similar books."

Askers' familiarity with the subject of their questions was another type information that some of them included in order to put their questions in context. Specifically, they described how experienced they were with the subject or how knowledgeable they were about the subject. S29, who posted a question about CrossFit shoes, explained that "I specified the amount of time I have been involved in the sport. Because I know … I'm not to a level where it really matters that I have $300 shoes or whatever." S24 similarly stated that he wanted to make sure answerers knew how much he already knew about the topic when he asked a question on the nomination for the 2022 Winter Olympics.

Some participants believed that including a detailed description of the problem they were dealing with in the question would help them receive more specific answers. For example, S26 noted that "I did say 'It's a few cartons of milk' and I did say, 'It's going to expire in two days' just because if I didn't say that it was going to expire in two days, people would give me suggestions that require only a small amount of milk, which wouldn't really help." Another way of adding context to a question for potential answerers was to explain why participants were asking the question. S37, for example, stated that he included a description, saying that "I wanted to compete in these kind of memory competitions." He further explained that he had included this "so people understand what I'm trying to accomplish and therefore can give me better recommendations."

c. Target specific audience

A few participants intentionally used jargon in order to specifically target people who were knowledgeable about the subject, and thus receive more specific answers. S08 indicated that "I knew that the people who would answer this would be familiar with the makeup terminology so I wanted to be specific with 'drugstore dupes.'"

To appeal to specific audience among a large number of Yahoo! Answers users, a few participants also utilized the way the system works. When posting a question to Yahoo! Answers, askers were given two sections, a mandatory section for a question with 140-character limit and an optional section for additional details with 1500-charcter limit.

Some participants included main ideas in the question section to appeal to people who would be knowledgeable about the subject. For example, S05 explained that she included the topic in the question section because "when people are searching, I feel like it's going to be a lot easier if they know what I'm talking about it before clicking on it than seeing a question and being like, 'I don't even know what that means' and just passing by." She further stated that "I feel like I would get more people who would have information about that specific topic."

4.3.3.2 Use of Question-Formulation Strategies by Social Search Goal

Given that one's search goal is an essential factor in information seeking, search goals are likely to influence people's use of question-formulation strategies. This study identified that participants tended to employ certain types of question-formulation strategies more often than others depending on the goal they were trying to achieve. Specifically, depending on their search goals, the degree of emphasis placed on either the quantity of answers or the quality of answers varied. Figure 5 illustrates the relationship between question-formulation strategies and search goals with respect to the two dimensions of quantity of answers and quality of answers.

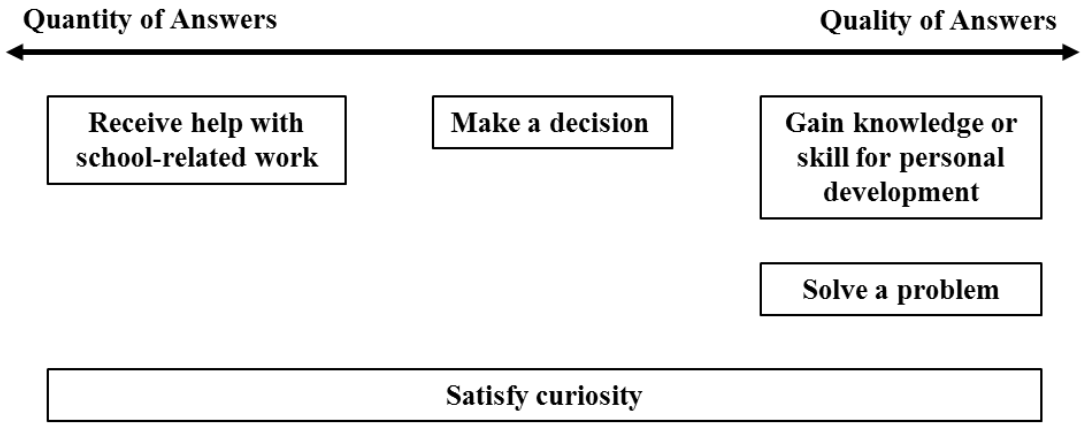

Figure 5: Relationship Between Question-Formulation Strategies and Search Goals

As discussed earlier, people tended to post questions out of curiosity spontaneously because curiosity was motivated unexpectedly by either a wide range of daily activities or long-held interests. Thus, participants just posted their questions to

Yahoo! Answers rather than thinking about how to phrase them. For example, when asked whether she had any ideas about how to write a question, S21 stated that "It was more of a wondering question rather than a specific question, so I figured I would just put it out there in case anybody had any ideas that could help." Similarly, S28 indicated that "I just asked the question that was off the top of my head after watching the Olympics with my friends." S15 also shared this sentiment, saying that "it was kind of just like a question that I have always wondered and I just didn't know how else to word it." Although participants mostly did not have thoughts about how to write a question when posting it out of curiosity, some did. However, among those who paid attention to how to write the question, no particular pattern of question formulation emerged. It seems that different strategies were selected either to increase the quantity of answers and/or to enhance the quality of answers depending on each search episode involving curiosity-based questions.

For questions posted to receive help with school-related work, participants appeared to put more emphasis on getting a large number of answers from many users in that they tried to lower barriers for potential answerers by leaving the questions open, and to attract attention of potential answerers by making them brief.

In contrast, it seemed that participants considered getting high quality answers more important than getting a large number of answers when they posted questions to gain knowledge or skills for personal development or to solve problems. While narrowing down options appeared to be important, participants' focus was more on providing contextual information to help potential answerers better understand the askers and their circumstances. Those who asked questions to gain knowledge or skills for personal development tended to provide personal background information to put their questions in context, while those who posted questions to solve problems offered detailed descriptions of their problem or situation more often.

Participants who asked the questions to seek information that would help them make a decision were located in the middle of the continuum, appearing to place an equal emphasis on getting more answers and on getting better answers. While they tried to make their questions more specific by narrowing down options and contextualizing them,

they also left their questions open in the hope of receiving a large number of answers from a large number of people.

Table 11 below shows the performance of questions posted by participants for this study by social search goal in terms of the percentage of getting answers and the average number of answers received.

Table 11: Question Performance by Search Goal (n=406)

Types of Goals	Frequency	Percentage of Getting Answers	Average Number of Answers Received
To satisfy curiosity	125	94%	3.49
To make a decision	77	92%	3.36
To receive help with school-related work	72	83%	1.63
To gain knowledge or skill for personal development	71	87%	2.42
To solve a problem	61	87%	2.11
Total	406	90%	2.74

Questions posted with the goal of receiving help for school-related work demonstrated the lowest response rate and received the smallest number of answers on average. Ironically, questions that tended to be formulated with more propensity toward the quantity of answers actually resulted in poor performance in getting answers. This may be because while more potential answerers looked at the questions, there were fewer people who would be inclined to actually answer them due to a lack of information needed to do so. Given the fact that questions posted with the goal of making a decision were ranked second in terms of response rate and average number of answers received, using a combination of strategies focusing both on the quantity and quality of answers may be the most effective way to formulate questions, regardless of whether the asker wants more answers or better ones.

4.3.4 Social Search Outcomes

Social search using Yahoo! Answers involves interactions not only with information but also with real people in the process of seeking information. By examining how people perceive the outcome resulting from social search in this setting in

terms of not only the informational but also the social dimension, the effect of social interactions in information seeking can be better understood.

4.3.4.1 Informational Outcomes

I defined "informational outcome" as a result that a person who posted a question to Yahoo! Answers perceived him or herself to gain from information contained in the answers provided by other people. In this study, the informational outcome was operationalized as participants' ratings of success in seeking information using Yahoo! Answers, contingent on that question having received at least one answer.

In line with the results from this study regarding question-formulation strategies and expectations for answers, both the quantity of answers and the quality of answers were taken into account in participants' perceptions of informational outcomes. It is noted that, however, there was a necessary condition that had to be met regarding the answer prior to any discussion of informational outcomes, which was that the answer must address the question posted by the asker. Once this condition was met, meaning that the answer was found to be pertinent to the question, how many answers one received and how good those answers were came into play in participants' perceptions of informational outcomes. As Table 12 shows, a variety of informational outcomes were identified.

Table 12: Informational Outcome from Social Search

	Informational Outcome
Answer-Quantity related	Receiving multiple answers from different people Gaining a variety of opinions on the subject
Answer-Quality related	Obtaining a comprehensive answer to the question Getting new perspectives Obtaining extra information Getting direction for further research Acquiring resources for future use Confirming an existing belief Obtaining an effective answer

a. Receiving multiple answers from different people

One informational outcome related to the quantity of answers was receiving multiple answers from different people. Participants liked the fact that they could

compare multiple answers from different people and choose among them. For example, S68 argued that "the amount of people who answer always play a part," when discussing how successful the search was. S59 mentioned that "even though there were the inappropriate answers, I think … there were six answers and three of them were what I was trying to figure out, so I was able to just toss out the other ones." Similarly, S67 explained why she found her search successful, stating that "I got a lot of different answers and … they all answered what I was specifically looking for and I felt like having multiple answers—I think there were seven people who answered—it really gave me a good sense of what I was looking for."

b. Gaining a variety of opinions on the subject

Another quantity-related informational outcome was to receive answers that represented multiple sides of an argument relating to the subject of interest. Participants appreciated the fact that they were able to gain a variety of opinions on the subject, either through receiving a large number of answers or through receiving an answer that contained multiple options. For example, S67 liked that she got "multiple suggestions and brands" in response to her question about ways to remove stains from a couch because she had multiple options that she could try. In a similar vein, S75 who asked a fashion question, explained that "I got an array—like I got two yeses and a no so it was a lot of diversity in answers." S26, who asked a question regarding recipes using milk, also stated that she found her search very successful because of one particular answer that gave her "a lot of suggestions."

c. Obtaining a comprehensive answer to the question

In addition to answer quantity, the quality of answers also influenced people's perceptions of informational outcomes. Obtaining comprehensive answers that covered as many aspects as possible in relation to the subject of the question was one informational outcome related to answer quality. S20, who asked a question about the best method for studying economics, stated that "I got an extensive answer where he recommended a book and wrote about what he learned from the book … and he gave a bunch of tips, and I appreciated the length." S48, who wanted to learn how to get through a theater company audition, explained that "in one answer they were able to address all different aspects of

the question whether what I should wear, how I should approach the audition, but also the outcome that could happen, which yeah, it's likely I won't get the audition, but it could be something I could learn from." Similarly, S69, who posted a question to look for ways to deal with her stolen laptop, described that "they gave me … the order or some sort of structure of things I should do … I feel like they answered the question completely and thoroughly."

d. Getting new perspectives

Participants also found their search successful when they got new perspectives from the answers they received. Information contained in the answer that pointed out aspects they had not previously considered in relation to the subject of interest was valued. S70, who looked for ways to make her computer run faster, indicated that "I thought that for the lack of specificity I gave, I got good answers because they did suggest things that I had never thought of before." Similarly, S75 found her search "very successful" because she "got an unconventional answer" that she had not thought of in response to her question about tips to lose weight. S06, who asked a question about some good songs to learn for a beginner at guitar, also stated that "there is also the four chord strumming pattern that I could just learn and use for multiple sing-alongs, which was a nice surprise because I wasn't even thinking about this, but this applied to me a lot also."

e. Obtaining extra information

A few participants appreciated the fact that those who answered their questions provided extra information that they had not specifically asked for but that turned out to be relevant and useful to them. S22, who asked a science-related question, stated that "this guy even provided a little bit more that I found to be relevant and interesting." In a similar vein, S65 who posted a question about the origin of the idea of modern Bigfoot, said "I learned even extra information about the Abominable Snowman." S69, who looked for ways to get nails to grow long and healthy, also explained that "they not only gave me a solution, but they gave me a cause, which was really helpful to know that I should probably buy a pair of gloves."

f. Getting direction for further research

Some answer-quality related informational outcomes addressed the usefulness of information in relation to the asker's information seeking in the future. Some participants reported that information they obtained from answers guided them in the right direction for further research on the subject by narrowing down what to look for. For example, S72, who asked a question about Halacha, Jewish law, stated that "I feel like that person gave me a direction to go in and like a springboard per se." Similarly, S36 noted that the answers he received in response to his question on responsibilities of international lawyers encouraged him to "ask additional questions." S40 also said that "I think the second answer provided me with some direction to be going," when talking about her question on career prospects after law school. She further explained that "it's not really specific information probably but it does give me a sense of what things are like and what I should be looking for."

g. Acquiring resources for future use

A few askers attributed success in their social search to the fact that the answers they received contained information such as links to other websites that they would consider using later even though they did not see its usefulness currently. For instance, S06, who asked a question about opening a Roth IRA as a student, stated that "it does give me somewhere else to turn to if I have any other specific problems or issues or questions." S48, who looked for ways to find a summer job, also said that "now I have the potential to use that website that I was given." Similarly, S63, who searched for sites with discount men's designer clothes, mentioned that "I did find a resource that I think I can use in the future."

h. Confirming an existing belief

While some informational outcomes deal with the usefulness of information in the future, there are informational outcomes that involve the usefulness of information at the moment of receiving answers. Some participants found their search successful when they were able to get confirmation of an existing belief from other people. For example, S09, who was curious about why Dutch people are tall, said she "got some [support]" for her belief that "it might have to do with diet and genetics." S77, who asked a question about

Beijing's air pollution, stated that "I kind of had the idea that it wasn't terrible for eight weeks, so I was just kind of looking for confirmation of that." Similarly, S67 indicated that she got what she wanted from the answer to her question about fostering a cat because she wanted to "get more reassurance that other people have done this before and that it would be something that we could do."

i. Obtaining an effective answer

For some participants, obtaining an answer that could accomplish their purpose appeared to matter when it came to the informational outcome. They perceived their search to be successful when suggestions or solutions contained in the answers actually worked for them. S36 argued that "answers can be right for me or wrong for me. But I love it when the answers are right for me." Moreover, regarding the responses to his question on ways to run longer distances, he described that "I tried these methods and I actually solved the problem that I was trying to get at." S29, who looked for suggestions for some Hip/Hop artists similar to Kendrick Lamar, stated that she "took the advice given," and "ended up pursuing and getting some of the music from [the answers]." In a similar vein, S41 indicated that the answer she received helped her plan a vacation in L.A. as she actually planned on going a place recommended by the answer. S57, who asked a question about ways to deal with hacked email, also reported that "he helped me fix my problem about my email so that's exactly what I wanted to gain from this, so there's nothing left to be desired."

4.3.4.2 Social Outcomes

I defined "social outcome" as a result that a person who posted a question to Yahoo! Answers perceived him or herself to gain from the experience of interacting with other people in the process of seeking information. In this study, the social outcome was operationalized as participants' ratings of satisfaction with interaction with other people in the process of seeking information using Yahoo! Answers, contingent on the question having received at least one answer.

Social outcomes can be discussed at the levels of both direct and indirect interactions with other people that take place in this setting. Direct interactions refer to one's interactions with answerers in the form of receiving answers to one's question,

while indirect interactions refer to interactions with people other than answerers in the form of receiving votes on answers or having a best answer selected. Moreover, not surprisingly, it appeared that informational outcome had little impact on participants' perception of social outcome as they often found their search satisfactory even though they did not get what they were looking for from the answers received. Table 13 below shows social outcomes from social search that were identified in this study.

Table 13: Social Outcome from Social Search

	Social Outcome
Direct-Interaction related	Getting a good vibe from answers Appreciation of people's attempts Appreciation of people's effort Appreciation of people's understanding of needs Appreciation of people's responsiveness Enjoyment of learning what other people think
Indirect-Interaction related	Finding others' endorsement valuable

a. Getting a good vibe from answers

Nearly all participants indicated that they found their experience of interacting with other people satisfactory when they received answers that indicated the answerer's niceness, engagement, or interest. Such good vibes were mostly conveyed through the way the answer was written. For example, S12 found an answer he received "personable" because it said "Best of luck." Similarly, some participants like S60 and S63 liked the fact that answers had "exclamation points of excitement" or "a little smiley" in them. S40 expressed her high satisfaction with interactions with other people, stating that "these people seem pretty nice and their words are pretty lovely and sweet." S79 also explained that he found the search experience satisfactory because he could see that those who answered his question were interested in the question.

When it came to social outcomes, it seemed that many participants compared their experiences with prior ones that they had either on Yahoo! Answers or on the Internet in general. S42 said "I have seen some answers that people write on Yahoo! Answers and they're totally rude," and appreciated the niceness of those who answered her question. Similarly, S55 reported that "it wasn't bad because I know I have read some questions before where I was seeing people are really mean or people say stuff that's not helpful at

all." S53 also stated that "they were all very polite and fine, which is not totally what I expected … from other Internet things. Like a lot of comment sections when people don't have to use their real names, are very rude." S73, who received a negative response to her previous question, expressed her satisfaction with her experience in relation to another question, indicating that "there wasn't anyone attacking my question and being like, "Why are you asking this question?""

Some participants found their search experience satisfactory when they felt that other people were really engaged in answering their questions. S60 liked the fact that one answer has "exclamation points of excitement in it." Similarly, S63 perceived that the answerer was nice because of "a little smiley" used in the answer. S79 also explained that he found the search experience satisfactory because he could see that those who answered his question were interested in the question.

b. Appreciation of people's attempts

Participants also appreciated the community aspect of Yahoo! Answers, the fact that people were trying to help others by answering a question although the answers were not really helpful. When asked why he was satisfied with the experience of interacting with other people even though he did not get an answer, S20 explained that it was because "someone took the time to answer the question." Similarly, S21 said she was satisfied because "they did answer, so it shows that they are at least putting in some effort to helping me out." She further explained that this is "a positive thing as far as communities go." S38 also indicated that his satisfaction was contributed to by "their attempt" to help him despite the fact that he did not get any benefit from the answers he received.

c. Appreciation of people's effort

Being fully aware of the possibility of negative responses due to the anonymous nature of Yahoo! Answers, participants were grateful when answers indicated that those who answered their questions were serious about the questions and put effort into answering them. For example, S72 noted that "it would be so easy just to post something and not take the time to respect someone because you're not having a personal interaction with that person like you would in-person. So I respect it or like it when people take the

time to do that in response to my questions." In a similar vein, S02, who asked a question about the top five songs of an artist, expressed her appreciation of the answerers' effort, saying that "it seems like they actually thought about it instead of just listing off the most popular five songs that they could think of." A few participants even reciprocated the answerer's effort by giving an up-vote or comment. S78, for instance, stated that she rated and commented on an answer because she felt that the answerer "took the time" to answer her question and she wanted to "reciprocate."

d. Appreciation of people's understanding of needs

Participants also found their experience of directly interacting with other people satisfactory when those who answered their question actually paid attention to their question and understood what they were looking for. S26, who posted a question about the healthiest milk, expressed her satisfaction, explaining that "I mean obviously that person knows—he or she read my question saying that I only know low fat and whole fat milk. So I guess that person really tried to convince me by telling me the pros and cons of each instead of just saying, 'You should drink almond. Full stop.'" S72 said that "he really understood where I was coming from on this question because I think my question I intended more nuanced than maybe I actually portrayed in my question." Similarly, S77 stated that "I enjoyed that they seemed to actually be paying attention to what I was saying instead of some of them were just generally saying random."

e. Appreciation of people's responsiveness

A few people appreciated that answerers were responsive enough to respond to their questions in a timely manner. S14 stated that "I got immediate feedback. It was nice knowing that you could post a question on Yahoo! Answers and most of the time you get feedback right away if it's an answerable question." However, it is noted that the perception of being responsive varied depending on participants, ranging from a few minutes to a day. For example, S08 expressed her satisfaction by indicating that "I received responses right away, [in] the first few minutes [after] I posted it." On the other hand, S57 said that she was satisfied because of the answerers' promptness with their responses, which came "within the same day."

f. Enjoyment of learning what other people think

Regardless of the quality of answers they received, some participants found it entertaining to learn what other people thought by directly getting answers from a large number of people. For example, S09, who posted a question regarding the height of Dutch people, stated that "I actually had quite a fun time reading these … Satisfied on a joyous level and not informational because I didn't get anything out of that." Similarly, S51, who asked a question about language quirks of people living in the East of England, reported that "this one, the second answer, doesn't really pertain to my question, but it was interesting to hear about anyway, so it was kind of cool just to hear what other people had to say." S79 also liked to see people's "personality" in the answers to his question surveying the best book one has ever read. He elaborated that "they don't just give me the title; they're trying to tell me a little bit about it and why they like it. So I thought it was very interesting."

g. Finding others' endorsement valuable

In some cases, not only participants' interactions with those who answered their questions but also their interactions with those who provided feedback on the answers they received played a role when it came to social outcomes. They valued other users' endorsement in the form of thumbs up/down votes or the best answer selection as this allowed them to get additional feedback from a group of people who were different from those who actually answered their questions.

S25 said that he found the thumbs up/down votes useful and believed that they had some value. He further explained that "if an opinion is backed up by many people, then maybe you are more pressed to believe it than ones that aren't backed up." Along these same lines, S65 liked the fact that other people helped him obtain good answers through votes, saying that "other people recognized that this guy's answer was pretty bad, so I noticed they also down voted and I also appreciated that overall." S35 also stated that "I think it's helpful that other users can vote on what they think is the best answer."

h. Acknowledgement of limitations in interactions

While most participants indicated that they found interactions on Yahoo! Answers easy and straightforward, some participants pointed out limitations in the interactions on

the site. S06 stated that "it did feel a little bit limited in that it's only Ask A, Answer B, and then Comment, and then that's the end." Similarly, S33 explained that "there isn't really a lot of interaction. It's just I ask a question and then they answer it and then I read their answers and get information from that." S11 also argued that "on Yahoo! Answers you kind of ask a question and you get something back; there's not a whole lot of interaction … I mean there's not a whole lot of back and forth."

A few people attributed such limited interactions to the way Yahoo! Answers is designed. S49, for instance, said that "I guess they don't really want it to become a conversation thing. They just want a question and answer." S35 expressed his reservation regarding the option to choose the best answer with mandatory comment, stating that "I feel like if I responded to them, it would be kind of slow getting a response back." In a similar vein, S09, who left a comment on an answer selected as the best one, said that "I would have liked if they had commented back. But it's possible I don't go on here all the time. So it's possible they haven't even gone back on since I posted that."

Those who perceived limitations, therefore, wished that there existed more ways to easily convey their feedback or responses to people who answered their questions or to have follow-up conversations with the answerers when they wanted to do so. S47 explained that "the only thing that I felt like would have been nice is if I could have replied to them and then we could have had a possible conversation." S78 posted a question to Yahoo! Answers to get others' opinions about a washer/dryer unit that automatically transferred laundry from washer to dryer. When asked about the experience of interacting with other people, she replied that she wished she could have had a follow-up conversation with one particular user who provided information about the situation in Europe in the answer, asking questions such as "Do you live in Europe? Do you have friends that have this type of unit in their apartment?"

4.3.4.3 Comparison of Social Search Outcomes by Social Search Goal

A quantitative investigation of social search outcomes based on ratings provided by participants was conducted to supplement the qualitative analysis of social search outcomes based on content analysis of the interview data. As mentioned in Chapter 3, the ratings of success in search and of satisfaction with the experience of interacting with other people were collected for 364 questions that had received at least one answer at the

time of the interview, out of 406 questions posted by participants for this study. In conducting the quantitative investigation of social search outcomes, social search goal was used as a variable to compare possible variance in the perception of outcomes because search goal is considered the most important factor in information seeking.

Table 14 below shows the average ratings of information outcome and social outcome for each social search goal type. For the purpose of statistical calculations, participants' responses of not at all successful, slightly successful, somewhat successful, moderately successful, quite a bit successful, very successful, or extremely successful were coded as follows: 1=Not at all successful; 2=Slightly successful; 3=Somewhat successful; 4=Moderately successful; 5=Quite a bit successful; 6=Very successful; and 7=Extremely successful. Similarly, participants' responses of not at all satisfied, slightly satisfied, somewhat satisfied, moderately satisfied, quite a bit satisfied, very satisfied, or extremely satisfied were coded as follows: 1=Not at all satisfied; 2=Slightly satisfied; 3=Somewhat satisfied; 4=Moderately satisfied; 5=Quite a bit satisfied; 6=Very satisfied; and 7=Extremely satisfied.

Table 14: Participants' Ratings of Social Search Outcome by Social Search Goal

Types of Goals		**Informational Outcome (Success)**	**Social Outcome (Satisfaction)**
	n	***M (SD)***	***M (SD)***
To satisfy curiosity	118	4.17 (1.89)	4.26 (1.79)
To make a decision	71	4.34 (1.76)	3.99 (1.92)
To receive help with school-related work	60	4.80 (1.77)	4.72 (1.83)
To gain knowledge or skill for personal development	62	3.97 (2.17)	4.11 (2.10)
To solve a problem	53	4.08 (2.04)	4.30 (2.06)
Total	364	4.26 (1.93)	4.26 (1.92)

With respect to informational outcomes, participants perceived that their search using Yahoo! Answers was most successful when they posted a question in order to receive help with school-related work (*M*=4.80, *SD*=1.77), while they perceived that their search was least successful when they turned to Yahoo! Answers to gain knowledge or skill for personal development (*M*=3.97, *SD*=2.17).

With regard to social outcomes, participants considered their experience of interacting with other people within Yahoo! Answers most satisfactory when they asked a question in order to receive help with school-related work (M=4.72, SD=1.83), while they considered their interactions with other people least satisfactory when they used Yahoo! Answers to seek information in order to make a decision (M=3.99, SD=1.92).

However, no statistically significant differences were found across the different types of social search goals. Overall, participants seemed to find their searches moderately successful and to consider their interactions moderately satisfactory, as all mean values tended to be near the middle value of four. This might be attributed to the fact that different aspects of both informational and social outcomes played a role at the same time when participants rated these outcomes. As discussed previously, people may obtain a variety of informational outcomes as well as social outcomes. For example, although there were a few aspects that might make people find their search unsuccessful or unsatisfactory, people could consider their overall search successful or satisfactory to some extent if there existed other positive aspects that resulted in informational or social outcomes. Therefore, these negative and positive results seemed to offset each other and this resulted in the convergence to the middle value of four.

Moreover, although there was no statistically significant difference, comparisons between average informational outcome and social outcome for each goal type showed a pattern. Participants reported higher levels of informational outcome when their goal was to make a decision or to receive help with school-related work, whereas those held one of the remaining three types of goals reported higher levels of social outcome. As discussed in Section 4.3.3.2, those who asked questions to make decisions or to receive help with school-related work tended to place a certain level of importance on the quantity of answers, while those who asked questions to gain knowledge or skill for personal development or to solve problems tended to be more invested in the quality of answers when formulating their questions. Those who focused on getting high-quality answers may have been more likely to prioritize personalized answers. Thus, they may have been more likely to appreciate other people's attempts or efforts to answer their questions, and this may have resulted in higher levels of social outcome in those cases. Moreover, those who asked questions out of curiosity may have prioritized interactions with other people,

as they were more likely to use Yahoo! Answers for searching for fun. Therefore, this may also have led to higher levels of social outcome.

4.3.5 Summary

This section characterized participants' social search practices in the Yahoo! Answers setting by identifying social search goals, expectations for answers, question-formulation strategies and tactics, and social search outcomes. Participants used Yahoo! Answers to satisfy a variety of goals including satisfying curiosity, making a decision, receiving help with school-related work, gaining knowledge or skill for personal development, and solving a problem. It was found that participants considered both the quantity of answers and the quality of answers when it came to not only expectations but also question formulation strategies. Furthermore, with respect to question-formulation strategies, participants used different strategies and tactics depending on their search goals, placing different levels of significance upon either the quantity or the quality of answers. This study also identified a wide range of social search outcomes in terms of both informational and social dimensions. It was found that informational outcomes can come from either receiving a large number of answers or getting high quality answers. When it came to social outcomes, both direct and indirect interactions with other people influenced participants' perceptions of social outcomes, while a few participants recognized the limitations in interactions within Yahoo! Answers.

4.4 Credibility in Social Search

Among various aspects of information quality, credibility matters greatly in the context of Yahoo! Answers as people interact with people they do not know. Considering the characteristics of this setting, I investigated how credibility assessment differs from assessment in other settings, how people conceptualize credibility, and what specific criteria are used to assess it.

4.4.1 Characteristics of Credibility Assessment on Yahoo! Answers

Yahoo! Answers represents a unique setting in terms of credibility assessment in that it allows people to post any question about any subject and to engage in interactions with a large number of unknown people both directly and indirectly in the process of seeking information. Distinctive characteristics of credibility assessment that are

attributed to these characteristics of Yahoo! Answers were investigated. By characteristics, I mean the aspects that distinguish the way people assess credibility on Yahoo! Answers from the way they do in other online settings. Credibility assessment in this setting was found to differ in three aspects: (1) relativeness, (2) crowd-assistedness, and (3) transientness.

4.4.1.1 Relative Assessment

In the Yahoo! Answers setting, it is likely that a question receives multiple answers, providing the asker with a chance to compare the answers with each other. Therefore, the assessment of credibility in this setting is relative in that it depends on the answers received. Specifically, the relativeness can be categorized into two types: (1) relativeness in terms of the range of answers, and (2) relativeness in terms of the timing of answers.

a. Relativeness in Terms of Range of Answers

There is uncertainty about the quantity and quality of answers that one may receive when one posts a question using Yahoo! Answers. Therefore, credibility of information is determined relative to the range of answers one receives. The range of answers refers to how many answers arrive and how good these answers are. For example, information in Answer A that could have been considered not that credible in other circumstances might be considered credible if other answers happen to be of lower quality than Answer A. S05's statement nicely described this as follows. She explained:

> I would say that credibility has a lot to do with comparisons on Yahoo! Answers because you get a certain set of answers and then you read them all, but you're comparing one answer [with] the other. So it really depends on the range of answers you get. If you have an answer that's really stupid and that doesn't apply to anything, an answer that kind of has a little bit of information is going to seem very credible compared to that other answer. Whereas if you look at a different question and you have an answer that's kind of applied and has a little bit of information, but you have one with a link, and details and everything, that one's going to seem way more credible than the other one, whereas that other one seemed credible in that question. So I think it really depends on what you're comparing it to and the broad [range] of answers that you get for the question.

Moreover, this relativeness in terms of the range of answers seems to lead to satisficing in cases when people have limited capability to compare due to receiving a

small number of answers. For example, S26 stated that "I wouldn't say that it is the most convincing answer, but between those two, since I only got two answers, he would be the more credible." In a similar vein, S54 said that "I had selected it as the best, but I didn't think it was that good, but it was better."

b. Relativeness in Terms of Timing of Answers

When there are multiple answers to a question, they do not arrive concurrently. This difference in arrival time among the answers matters when it comes to credibility assessment. Specifically, the level of quality of the first answer appears to play an important role in this relative credibility assessment because it sets the bar for other answers that arrive later. For instance, S26, who received the first answer that was considered high quality and credible, explained that "So all other answers just make it seem as if they're not credible … particularly because I have received the answer, so when I see other answers, it doesn't really appeal to me because I have already seen a better answer than that." Similarly, S06 said that "if this was the only answer, I'd say it was a good one—a fairly good one—because it does answer my question … it's just the first answer was a lot better since it was a lot more specific and it also gave me a good source, too."

4.4.1.2 Crowd-Assisted Assessment

When people assess credibility in the Yahoo! Answers setting, where people reach out to a large number of people they do not know to find answers to their questions, the crowd's assistance plays a significant role in various ways. Specifically, the crowd's assistance takes the forms of endorsement and cross-referencing, serving as a reinforcing factor of a credibility judgment that has already been made.

a. Endorsement

The crowd can help people make credibility assessments by providing endorsement through feedback on answers provided by others. One of the ways that people can give feedback on others' answers on Yahoo! Answers is to give a thumbs-up or thumbs-down vote to the answers. Participants found these votes given by other people to the answers they received helpful when assessing credibility because they viewed them as a sign of reaching a consensus. S79 said that "credibility can come from the up votes

… it comes from the consensus of everyone else. Basically that everyone agrees that they're credible." S06 also stated that "if anyone did thumbs down, which I didn't experience, I would automatically think, 'Okay, maybe I should take this answer with a grain of salt. Maybe it's not exactly good at all.'"

While participants received the crowd's assistance in the process of credibility assessment through their own interactions with the crowd in the form of thumbs-up/down votes, this assistance can also take place through taking advantage of others' interactions with the crowd. For instance, one's activity history within Yahoo! Answers that is available through features such as number of points, level status, top contributor badge, and percentage of best answers is determined based on one's previous interactions with other people. Participants appeared to believe that those who had a good history (i.e., having more points, being at a higher level, or having a top contributor badge etc.) were more experienced users, and being more involved in the Yahoo! Answers community and more familiar with it, they were thus more likely to be credible.

For example, S23 stated that "I would click on users and if they showed a lot of points or they showed that they had a lot of answers, I would start to feel that they were credible." Similarly, S14 said that "you could go to the other user's page and see how they interact with other people, like do they answer a lot, what are they are rated at, and stuff like that, do they get best answers a lot." S57 also pointed out the usefulness of the answerer's level in assessing credibility, explaining that the answerer's level status showed their "commitment to answering questions on Yahoo! [Answers]."

A few participants considered a crown logo next to the user's name, which indicates that that person is a top contributor, to be a proxy for credibility. S24 explained that "I would assume it's based on points like how many times they keep answering and stuff like that. But if they are active on the site, if they're familiar with how it works and like what tools are available like on Yahoo! Answers, then that makes me trust them."

Similarly, those with a higher percentage of best answers tended to be considered more credible, as participants viewed this as signaling approval of the quality of their answers by a large number of people. For example, S57 said that "Someone who has a lot of best voted answers I would say is more credible because then a lot of users have thought that what they have to say is the best possible answer." S80 also emphasized the

importance of the approval coming from other users in identifying credibility. He explained that "It's much easier to see their past history on the website and to see if they have been chosen as the best answer by other people, so it's not just me but it's having at least another background set of data or people who have been choosing anonymously at least for whoever is responding." The same sentiment was expressed in the following remark by S56 on the percentage of best answers: "I think if it shows that other people had chosen it as the best and other people had selected it as something that they agreed with, that it just provides more credibility."

However, S08's statement that "I am aware that you can't always rely on that because they could just be answering many questions and getting points," demonstrated that there were some participants who had reservations about using the percentage of best answer as a proxy for credibility because a higher percentage of best answers did not necessarily mean that that person would give a high quality answer to the question.

It is noted that this endorsement by the crowd does not serve as a primary factor that determines credibility. It only reinforces the beliefs of participants once they have already been formed. For example, S44, who had already made a credibility assessment of an answer based on what the answerer had written stated that "when I checked it, he had a lot of points so then it affirmed my decision."

Therefore, it appears that endorsement by the crowd does not influence perceived credibility if it goes against the asker's belief. S39 argued that "if I found a good answer from my perspective that would actually clarify it, even if it was down voted, I would still consider it a good one." In a similar vein, S26 explained that "if I think the ratings would affect how I think, then I would not have picked my own answer … So obviously I know that this answer doesn't appeal to me and doesn't really help, but it still got the thumbs up. So it doesn't really help. I just go with my own judgment."

b. Cross-Reference

Having multiple answers to a question provided by the crowd also helped participants make credibility assessments. Specifically, participants used other answers as cross-references in order to determine the credibility of one answer. They tended to consider the answer more credible when there was consistency among answers, meaning that information contained in one answer was repeated in other answers when cross-

referenced. Consistency among answers seemed to serve as a reassurance. S19 nicely explained this characteristic of credibility assessment:

> I picked the ones I liked to check. I just I would go through a bunch of them and then some of them you would see repeating answers and when you keep seeing repeated answers, it convinces you a lot more. Like if you see something once, it's a little—you're skeptical at first, and then when you see the same thing come back again and again and again, it's like, "Well, then that must be right."

In a similar vein, S06 stated that "I also cross-reference their answer with other answers, too, if I am able to see if it matches up." S08 also explained that "if you pose a question and you have many responses, you can compare other peoples' opinions and see what is the majority and usually majority rules most of the time."

As cross-referencing is possible only when there are multiple answers, the number of answers received matters. A certain number of answers appeared to be required in order for them to have a real influence on participants' credibility assessments. S37 argued that "I think the aspect of quantity equals quality is the main aspect that's for credibility on Yahoo! Answers. With one answer, you can't compare it to anything, so it's really hard to gauge if it's a good answer. So I definitely think the more answers, the better." He added that "I gave him credibility simply because his answer also aligned very well with other answers, so it seemed I doubt three people grouped up together and just like, "We're going to trick him." So it was nice to see that other people could verify that his answers were pretty correct."

The cross-referencing can take place not only among multiple answers that one received but also among multiple answers to multiple similar questions. As discussed in Section 4.2.2, participants often searched a collection of accumulated questions and answers to find answers to their questions instead of posting their own questions to Yahoo! Answers. It was common for them to find a number of similar questions as a result of the search within Yahoo! Answers, and thus participants were able to have access to a much larger pool of answers that could be used for cross-referencing.

S07, for instance, explained that "when you search for them, it'll come up with maybe half a dozen of similar questions … So you can compare the different answers from over time. If it's not something that changes from 2007 to 2010, then you could see the consistency among the answers. I think that's also a good way of doing it: if you

compare the best answers from similar questions." Interestingly, there was one participant (S37) who recognized the value of selecting the best answer to a question for assisting others in cross-referencing in the future. He selected the best answer because "when you choose a best answer, it's for you and it's for whoever will have this question in the future. So I want that to be helpful to any future people that see this."

4.4.1.3 Transient Assessment

Credibility assessment in the Yahoo! Answers setting is transient in that it depends on the situation in which the search takes place. Specifically, depending on the type of information one is seeking and the kind of subject the question is addressing, the perceived importance of credibility and criteria used for credibility assessment differ. Moreover, the outcome of credibility assessment only relates to a particular search episode. The following quote by S08 clearly describes this characteristic:

> I think the credibility of Yahoo! Answers depends a lot on what type of question you're asking and also who is answering the question. So things such as beauty and style, like the makeup question, I feel like that's very subjective depending on who you are and what you believe is quality makeup, I'll just take that with a grain of salt like I'll compare it to my own knowledge. Oh, and it also depends on my own thoughts about the question, whereas things like science questions or biology questions, if I don't know the topic very well, I'll make sure to thoroughly read the question, read their responses, but then also back it up with other resources outside of Yahoo! Answers.

Many participants echoed the sentiment that the type of question matters when it comes to the importance of credibility. S70 explained that "For an answer that wasn't academic and just kind of asking you to ask it, I don't think there was any necessarily answers that are a whole lot more credible than other answers because it's just opinion-based. But for the ones that I asked that were academic, that's when I was definitely more wary of the answers I received." Similarly, S09 said that "it also depends on what question I ask. Some of them don't really need them."

Not only importance of credibility but also criteria used for credibility assessment vary depending on the type of question asked. Participants tended to agree that academic or scientific questions required objective support such as factual information, while for general opinion-based questions personal experience could be sufficient to establish credibility.

S31, for example, explained that "if I was talking about the science information, then it would be best for you to have some education that would have backed that up. But if I'm talking about hair where that just goes with practice and trial and error, then it would just be a matter of your kind of regimen." Similarly, S63 stated that "people will post questions about something very academic or a physics question or something where I think credibility could be more traditionally defined, but I think in the cases where I used it where I think credibility was … enhanced by knowing the person's experiences." S73 shared this sentiment: "Like the programming one, like I will know the person is somewhat familiar with the topic because he is answering my question with legitimate the terms we use, and stuff like that. So I guess they are credible. But then the other people for the more general questions, like beauty products or whatever, I guess they're credible in the sense that because they try to help me out and it's their personal experience that's credible."

4.4.1.4 Summary

Credibility assessment in the Yahoo! Answers setting was found to differ from assessment in other settings in that the assessment is made in a relative manner, it is reinforced through the crowd's assistance, and the context and result of the assessment is transient. Specifically, participants made credibility assessments that were relative to the range of answers they received and the timing of the answers' arrival. They also made credibility assessments with assistance from the crowd in the forms of endorsement and cross-referencing. The perceived importance of credibility and the criteria used for assessing it varied depending on what kinds of questions were asked.

4.4.2 Credibility Constructs and Criteria on Yahoo! Answers

Traditionally, credibility has been characterized by two primary components: expertise and trustworthiness (Hovland et al., 1953). However, it remains to be investigated how people conceptualize credibility in a social Q&A setting, where interactions with a large number of unknown people and with information provided by those people take place in the process of seeking information. New constructs may be identified while traditional constructs also prove to be applicable to this setting. In this study, I adopted a definition of construct suggested by Hilligoss and Rieh (2008),

whereby a construct as a fundamental basis for credibility judgment represents people's points of view regarding credibility when they conceptualize or define credibility.

When asked about what defines credibility in the Yahoo! Answers setting, participants commonly pointed out one fundamental assumption that credibility is found in answers they received and not in those who answered their questions. In this setting, participants interacted with people they did not know. They found it challenging to investigate who these people were because there existed very few cues about the answerers and it would be difficult to verify obtained information even if they got information about them. As a result, participants seemed to believe that it would make more sense to focus on answers rather than those who provided the answers.

For example, S68 pointed out the anonymous nature of Yahoo! Answers and the Internet in general, saying that "it's super-anonymous … on the Internet, even if people say they are a certain thing, they could be lying. Like there's such a capacity to get incomplete or incorrect or false information. So assessing credibility that way, I pretty much look for what people say as opposed to who they are to see how credible they are." S54 echoed this sentiment and argued that "you can assess credibility through looking at the answer, the way they worded it." In a similar vein, S06 indicated that "I feel like me determining whether or not the answers were credible or not are just in the quality of the answers."

Given that in this setting, credibility is found in the answer one receives, then what specific constructs would define credibility? The analysis of the interview data identified four constructs of credibility: (1) pertinence, (2) expertise, (3) sincerity, and (4) validity. Furthermore, for each construct, what specific aspects of the answer were noticed by participants and interpreted as a sign of credibility in a social Q&A setting? In this study, criteria referred to those aspects that were recognized and used by participants to make credibility assessments. Table 15 shows four credibility constructs along with credibility criteria associated for each construct.

Table 15: Credibility Constructs and Criteria

Construct	Criteria	Definition

Construct	Criteria	Definition
Pertinence	Applicability	Whether the answer is applicable to the asker considering her circumstance
	Novelty	Whether the answer contains new information considering the asker's knowledge about the subject
	Diversity	Whether an answer offers multiple options that the asker can try
Expertise	Being experience-based	Whether information contained in the answer comes from the answerer's personal experience
	Thoroughness	Whether the answer addresses different points, elaborates, and provides details in relation to the subject
	Being well-written	Whether the answer is presented in a clear fashion
	Reputability	Whether the answerer holds good reputation
Sincerity	Seriousness	Whether the answerer takes answering seriously
	Niceness	How nice the answerer is in answering the question
	Effort	How much effort is deemed to be invested by the answerer in the answer
	Being spam-free	Whether the answer contains no information suggesting an intention of phishing or advertisement
Validity	Source	Whether the answer indicates where the information comes from
	Congruence	Whether the answer agrees with the asker's knowledge about the subject

4.4.2.1 Pertinence Construct

Pertinence, as a fundamental construct of credibility in the Yahoo! Answers setting, refers to whether an answer specifically pertains to the question that one posted. In this setting, since participants present their information needs in natural language and receive answers from real people, they expect answers to be pertinent to their questions. The pertinence in this setting goes beyond the fact that answers are merely on topic and is more related to the effectiveness of the answers, which depends on the degree of personalization enabled by interactions with real people. The following quote by S34 described the construct of pertinence well:

> Aspects of credibility would be relevancy and how relevant they are to the question and not random things I don't care about like I see on some of the posts. So probably relevancy would be the main thing for credibility.

Whether the answer is pertinent or not seemed to serve as a fundamental condition that should be met in order for the answer to be credible. S66 indicated that "I usually—if something seems very random and not relevant, then I automatically don't give it credibility. If it seems like slightly relevant or something that relates, I would look

into it more." S42 similarly argued that "Good answers answer questions. A lot of the answers that I see on here are really just off target. So I feel like if you actually answered the question, you're on the right track already."

In a similar vein, some participants shared their perception of the credibility of Yahoo! Answers itself. S34 said that "I think it's decently credible because sometimes you just get irrelevant responses, but most of the time, even though they might not be too detailed, people still respond to your question in the way that you state it, so I think it's moderately credible." S41 also offered her insight on credibility of Yahoo! Answers based on her experience. She explained that "I would say it's pretty credible. All the answers I have gotten, they were all helpful. But then there's answers like this one that it just throws off because anyone can answer anything and put whatever they want. But most of the times all the people answered the question and answered it correctly, so that's why I would say it's pretty credible."

4.4.2.2 Criteria Associated with Pertinence

In relation to the construct of pertinence, three criteria were found to be used for credibility assessment: (1) applicability, (2) novelty, and (3) diversity. These criteria determined the degree of personalization of the answer, indicating how pertinent the answer would be considering the asker's situation.

a. Applicability

When the answer was applicable to participants considering their circumstance, they found the answer credible as it was pertinent to their question in that it served their purpose. Applicability can take the form of either potential usefulness or proven usefulness.

Some participants found an answer potentially useful, considering the possibility of using it in the future. For instance, S06, who looked for songs to learn on guitar, explained that "I really liked her answer because what she gave me really … it's specific enough and it's also versatile enough for me to use in more than just a couple songs. Like after learning these chords, I can play a handful instead of just a couple." S65 also indicated the potential usefulness of the resource he obtained from an answer. He noted that "he gave me a list of people and then some actual sources where I could potentially

find more ... he gave me places to find more and a source where I can actually go and potentially learn about these people."

On the other hand, some participants actually tried what the answer said and found that it worked well in their situation, serving their various purposes. S22, who looked for a website for an interactive Periodic Table of Elements said that "I downloaded the app and I thought it was very helpful. And it was exactly what I needed." S41 tried a TV series recommended by the answer as it suited her situation well. She explained that "I picked this one because House of Cards is on Netflix so it was easy for me to start watching it and actually I'm watching it right now and it's really good." In a similar vein, S51, who asked for information about language quirks in a particular area of England to get help with a story that she was writing for her class, said that "I actually ended up using this answer a little bit in my story ... So it was kind of an interesting addition to my story."

b. Novelty

Given the knowledge that participants already possessed in relation to a subject, answers that contained new information that participants could have not found on their own, or ideas and perspectives that they had not previously considered were regarded as pertinent to their situation.

S16 pointed out the uniqueness of the information he obtained from an answer, saying that "it gave a link that I wouldn't have been able to find on my own probably." In relation to her class project, S78 looked for information regarding a washer/dryer unit that automatically transferred laundry from washer to dryer. She appreciated that she gained new information she had not found before from the answers she received. She explained that "one person said, 'They sell those in Europe.' And I thought this was so necessary to bring back to my group and share with my group because this is a problem with our—we can't just make this invention that's already out there, which I had no idea it was out there. And then another person said, 'Mine already does that.' So I was really shocked to hear that, too! Because we thought maybe there might be a similar product, but we hadn't ever heard of it being in the States at least."

Suggesting different ways to do things that had not occurred to participants was also found to be valuable. S76 liked the fact that he obtained information about ways to

find internships that he had not been aware of. He explained that "they also mentioned looking via Monster.com and that I never thought about that. I didn't think about looking on job boards would help me with finding an internship ... they also mentioned contacting companies directly, which I didn't think about at all. I didn't think that that was an acceptable way of figuring out if someone had an internship available." Along these same lines, S67, who asked a question about fostering a cat, said that "it was helpful because they talked about getting to the vet and whether we have a car, which is something I hadn't thought too much about before."

Participants also enjoyed gaining new perspectives and knowledge from answers. S47 who asked a question about a stuffy nose found the answer interesting because it provided her with new perspective regarding the subject. She explained that "I thought it was a different I guess approach instead of going for medicine, he or she went for medicinal ways like, "Use Vitamin C, don't do things that build up phlegm," which was something I honestly didn't think about." Similarly, S76 appreciated that an answer offered a different look at his problem of a swollen finger. He said that "the second part, which I actually thought was more interesting was, 'Just because it may or may not be broken doesn't mean you didn't injure a tendon or a ligament,' which is something I didn't even consider." S64 expressed his enjoyment of obtaining new knowledge, saying that "I think this one was probably one of the best answers I have had on Yahoo! Answers. The guy really knew what he was talking about and he mentioned stuff that I didn't know what I was talking about and that I have never heard of."

c. Diversity

Along with novelty, diversity in information provided by the answers appeared to matter when considering credibility in Yahoo! Answers setting, especially in relation to pertinence. Participants found answers that offered multiple options that they could try more credible because the availability of more options in the answer meant that the answer was more tailored to their situation.

For example, S69 posted a question to look for ways to deal with her stolen laptop. She greatly appreciated that she was given multiple options that she could try to address her issue. She explained:

> They posted it and I was like, "Okay, well, try to find my Mac" and I did that. And then they put, "Lock the Mac," and I didn't know you could do that, so that was helpful. "Possibly find its location and take photos." I couldn't figure out how to take photos of the user. I was confused as to how to do that if that doesn't work or you can't activate the function. "Go to the police" and I did and they're still trying to look for it. "Contact your insurance company if you have it as well as providing money to replace it, they might also give advice on how to retrieve it." And so they went through different steps and so I really liked that. They said, "Oh, well, turn this on. If that doesn't work, call the police. If that doesn't work, go to the insurance company." So it was pretty thorough, and it just says, "This, this, and this and that's how you should."

S31, who wanted to learn more about career paths for a public health major, stated that "it did talk about actual positions so teaching in colleges, nutrition specialist, and that's what I was looking for as far as the actual careers ... it gave me a nice variety so that's what I was looking for … not just one sole position." Similarly, S50, who sought information on career paths for a women's study major, recognized "a wide variety" and "a lot of different options" offered by the answers. S48, who looked for nail polish designs for beginners, also liked the fact that she obtained a variety of designs, saying that "she gave different types ... first she gave the simplest one, which is colored French. And then she broadened it a little bit to different things maybe I'd like."

The presence of multiple options in the answer also could be used to strengthen the perceived credibility by reducing the possibility of spam links. For instance, S26, who asked for information about airport shuttle services, indicated that "he or she gave me a lot of answers so I guess that makes it more convincing since she or he gave me a lot of suggestions instead of just one website. If that person just gave me one website, it gives me the idea of that person is trying to promote their business. But since she gave me a lot of websites and ideas, I guess she wasn't really trying to do business since she suggested other websites or other ways and not just if she has her business, not just her business."

4.4.2.3 Expertise Construct

Not surprisingly, expertise, one of two primary components of credibility, was identified as one of constructs that define the credibility in the Yahoo! Answers setting. As Fogg and Tseng (1999) have suggested, expertise refers to the perceived knowledge of the source. This dimension relates to how knowledgeable the answerer sounds based on his or her answer.

Participants tended to consider the length of an answer as a sign of expertise. The longer the answer, the more likely it was to offer a more detailed and thorough explanation in relation to the subject of the question. Participants believed that being able to explain something in detail meant that that person knew what she was talking about. This perceived relationship between the length of an answer and the possession of expertise was captured well by S47:

> If they give me just a simple, short sentence that lacks specific details about what I was specifically asking for, I wouldn't view them as that credible, just because it seems like they're just going off what they think or feel without really knowing what the real answer would kind of be or from their own experience. And I guess I noticed that the longer responses that provided full, more details, looked like to me they seemed more credible just because it kind of made them sound like they knew what they were talking about.

As discussed previously, the underlying assumption was that what was said in the answer mattered, not who the answerer was. S26 suggested that "if you give me a long answer and give reasons for each of the answers that you gave me, that would be very credible to me … you are probably just a kid, but … if you gave me a lot of logical explanations, I would just say that's credible."

In a similar vein, S51 argued that "I think that giving a very detailed answer and showing that you know a lot about the subject, that's where you find credibility." S18 said that "I see someone as credible by how thoroughly they answer the question and how much detail they give." S12 also echoed this sentiment, stating that "anybody can give a one-word answer to something. You really need an explanation to make it seem believable."

4.4.2.4 Criteria Associated with Expertise

A number of criteria that were used by participants to determine whether the answerer knew what she was talking about were identified. These criteria include (1) being experience-based, (2) thoroughness, (3) being well-written, and (4) reputability.

a. Being Experience-Based

Whether information contained in the answer came from personal experience of those who answered their question was considered when participants assessed credibility. Participants found the answer more credible if it contained information indicating that the

answer was based on personal experience because they thought that having experience with the subject meant a person was knowledgeable about the subject to some extent.

S56, who looked for first-time flying tips regarding bringing carry-on bags on an airplane, explained that she found the answers credible because "it seemed like they had a lot of experience flying before and they had done this many times and it wasn't just something that they had found; it was something that they had done themselves and have firsthand experience with." Similarly, S26, who posted a question on milk, believed that the answerer's personal experience of "being lactose intolerant" was a sign that the answerer had good knowledge about kinds of milk. She explained that "So I guess for a person like her to drink milk, I'm pretty sure she wants to drink milk, so for a person like her not being able to drink milk, she must have done a lot of research for her own diet." S10, who asked a question about behavioral questions employer would ask in a job interview, also indicated that "since he explained so much, I think he has certain experience in maybe attending interview or maybe interviewing people. So I still think that I can accept his credibility."

An explicit firsthand account by an answerer appeared to be more effective in convincing participants. S72, who wanted to know what the best nursing field was, took one response which said "I actually cried the day I had to do my OR rotation as a student," as an example. She stated that she "tended to trust her answer just because she indicated she had the experience." Similarly, S77, who asked a question on Beijing's air pollution, showed trust in the answer he chose as the best answer, saying that "the one who said that he'd lived in Beijing for four years and never wore a face mask, I trust his opinion because he's got experience."

Not only the experience that the answerer actually went through but also the experience of someone else the answerer knew seemed to be accepted as a sign of the answerer's being knowledgeable about the subject. S48, who wanted to learn how to get through theater company auditions, appreciated that the answerer shared her daughter's experience with her, stating that "Personally she would know what her daughter knows and so she had some sort of person in her life has experience with it so they know about it and could offer me help with it."

Some participants considered background information such as education and occupation as a sign that indicated that the answerer was familiar with the subject. When asked to explain the reason she found an answer credible, S40 explained that "one of the reasons is that I mean I don't know if that's true, but it's a lawyer from a top 10 law school." Similarly, regarding the response to her question related to Judaism, S72 said that "he also listed sources as "Orthodox Rabbi" so I thought, 'That's a very good source.' Like that's the kind of person in real life that I would ask this question. And so that made me really trust this person."

b. Thoroughness

Another sign of an answerer's expertise that participants noticed was how thorough the answer was. Participants found lengthy answers that addressed different points, elaborated, and provided details such as examples more credible.

Answers that covered different points of the subject were considered credible because participants thought that those who answered the question knew the subject well enough to discuss different points in relation to the subject. S06, who looked for good songs to learn for a beginner at guitar, liked the fact that an answer specifically talked about songs both for individual practice and for group practice. He stated that "it tried to go a little bit more specific between something I can do by myself or something I can do in a group." In a similar vein, S05 said that she appreciated that an answer covered both sides of the issue of tipping a delivery person. She explained that "I liked that they kind of addressed both sides of it, saying, 'If it's this, it's probably the tip. If it's this, it's the delivery fee and you should tip.'"

Some participants recognized that thorough answers tended to include explanation along with the answerer's statement. For example, S29, who wanted to learn what Epidemiologic Transition was, explained why he found the answer he received thorough. He said, "It's not like he just threw me a definition, which I could have just found on my own ... the amount of detail he presented in his answer made me interested in hearing what he had to say." Regarding the response to his question on finding the Absolute Magnitude, S22 stated that "it showed me how to do it and it gave me the steps that I had to do it in and not just jumping right to the answer."

Answers containing specific examples and details in relation to the subject were also considered thorough. S21, who looked for information about cars' gas mileage, explained that he found an answer thorough because "they were specific explaining specific points of the cars and they talked about a specific brand." S56, who posted a question on carry-on bags on an airplane, indicated that "he or she had given me a lot more information more specifically about size requirements like what the typical size requirement is and things like that." Similarly, S40, who asked for recommendations for hair salons, appreciated that an answer gave her "both the name of the salon and the stylist." When discussing the answers to her question about tea steeping, S60 argued that "I figure the more specific you are and in detail about an answer, the more likely you actually know what the heck you're talking about," by citing one response saying that "depending on whether you put milk or sugar in it, it'll make it taste different so you can let it steep longer or less" as an example of such specificity. S67, who looked for ways to remove stains from a couch, found two answers she received thorough because both provided specific details such as brand, price, and tips. She noted that "the first one gives a specific brand and solution and also said, 'the trick is to get the liquid back out of the couch,' which is helpful to know before you start trying to clean that. And then the second one I thought was good because they also gave a specific brand and a price."

c. Being Well-Written

The way the answerer wrote an answer appeared to matter a lot when participants determined the credibility of the answer. They believed that the fact that the answerer presented the answer well meant that she was educated and knew the subject well. Therefore, participants considered well-written answers credible.

Specifically, participants found answers that were professionally presented with no typos or grammatical errors well-written. For example, S05 argued that "you obviously are going to think the person using proper grammar is more intelligent and has more information, so you're going to be more likely to trust the expert over someone who doesn't have as much." S25 also stated that "A lot of what he says makes sense and it's written in proper English, which makes me think that he could be possibly pretty credible." Along these same lines, some participants expressed distrust towards an

answerer because an answer did not have proper capitalization and punctuation. S39 noted that "I didn't give it much credibility just because it seems like a little bit too much. It's like capital letters everywhere and stuff."

Participants also considered how the answer was worded to see whether it was well-written. The use of jargon or sophisticated terms by an answerer was perceived as a sign of the answerer having knowledge about the subject. S64, who asked a question about dolphins, explained that "you could tell somebody knows what they're talking about specifically through the terminology they use. If they use terminology relating to the subject like this guy did, then it just gives them more credibility." Similarly, S09 stated that "using those vocabulary kind of proves that they know something about it." S47 also indicated that "he was talking about … words that would be more with banking information. So it kind of made sense that he sounded somewhat that he knew what he was doing."

A well-structured answer that made the answer easy to read was also considered a proxy for credibility because participants believed that those who had a good understanding of a subject were more likely to present their argument logically in relation to the subject. S29 liked the way an answerer organized a long answer in a nice fashion, stating that "I would say the fact that he split it up into, 'Here is kind of a general overview' and then he split it up into more specific analogies and then gave a little summary. So I got the sense that he knew what he was talking about. It was presented in a nice fashion."

d. Reputability

Whether an answerer had a good reputation was taken into account when participants made credibility assessments. Participants looked at a wide range of aspects that indicated the activity history of an answerer to determine his or her reputability. These aspects include a top contributor badge, the number of points one had, the level status, the percentage of best answers, and the quantity and quality of answers provided in response to other questions.

With respect to the top contributor badge, participants considered the presence of the crown logo next to an answerer's name as an indication of accumulated experience with answering questions on Yahoo! Answers. For example, S31 said that "I saw the 'top

contributor' label under the name, so I thought that it was a pretty reliable source." Similarly, S75 stated that "usually when they have certain emblems next to their name, it means that they're better at answering questions. So since he had the emblem, like the crown thing, then I knew that it would be a good—a credible person."

Some participants even expressed blind belief in a top contributor badge without a clear understanding of how Yahoo! Answers assigned the badge to its users. S37 stated that "as you can tell, some of them have crowns, which I don't know what it means, but I think that it means that they have a lot of good answers that other people think that they have good answers."

However, there were some participants who recognized the limitation of the top contributor assignment mechanism. They were aware that the presence of the badge did not necessarily mean that person would provide a high quality answer because the mechanism tends to place more weight on the quantity of answers compared to the quality of answers. A few participants even pointed out that the answers provided by a top contributor actually turned out to be of poor quality. For instance, regarding one response to her question, S31 complained that "I don't think they answered the question at all." She further explained that "I thought it was pretty ironic that they said that that was a top contributor, meaning that the person frequently gives their input. So you would think if they would frequently give their input, you would be able to actually address the issue. But … that didn't answer the question to me."

A very small number of participants looked at a user's profile to check aggregates of previous activities such as the number of points, the level status, the percentage of best answers, and the quantity and quality of answers provided in response to other questions. S13 said that "he has a very good record on Yahoo! Answers. So in addition to a good record, I read some of his answers to other questions and they seemed very credible and reasonable." S44 expressed a similar sentiment, stating that "when I clicked on his profile, he also had more points than the other people. So I think I valued him more." He also indicated that he found the answer provided by the user who had "good reviews and a good amount of points" more credible when he discussed his experience with another question he posted to Yahoo! Answers. In a similar vein, S64 said that "if you scroll over his information, 72% of his answers are best answers. So he seems like he's had

experience with answering other questions. So that's why you can also tell his sources are credible."

4.4.2.5 Sincerity Construct

According to Fogg and Tseng (1999), trustworthiness, another primary component of credibility, captures the perceived goodness or morality of a source. Sincerity aligns with the dimension of trustworthiness in that this relates to the perceived well-intentionedness of those who answer a question in the Yahoo! Answers setting. The dimension of sincerity refers to how sincere an answerer is in providing an answer to the question.

Since answers come from real people, how well-intentioned an answerer was appeared to play an important role in defining credibility in this setting. For example, S01 argued that "the answers are only worth it if … the person actually cares about answering your question and cares about helping you rather than just answering the question and getting points." S32 similarly stated that "I was judging credibility in terms of how genuine the people were."

Along these same lines, S21 stressed the significance of the answerer's "demeanor" as conveyed through an answer, although she acknowledged the difficulty of identifying this online. She explained that "for instance, this person, they gave a smiley face, they sometimes use exclamation points, which I think is a way of showing their enthusiasm and generally nice demeanor online." S43's also indicated the importance of positive demeanor of an answerer in the process of credibility assessment. He said that "if a person doesn't make sarcastic comments or derogatory comments and answers the question directly, I give them more credibility than others who don't follow those guidelines."

4.4.2.6 Criteria Associated with Sincerity

Four criteria that deal with the attitude of answerers, (1) seriousness, (2) niceness, (3) effort, and (4) being spam-free were found to affect participants' credibility assessment by helping them get a sense of the sincerity of answerers.

a. Seriousness

Participants looked at whether an answerer took answering seriously when assessing the credibility of the answer in the Yahoo! Answers setting. They believed that taking answering seriously indicated the answerers' sincerity in that those who were serious about answering tended to actually read the question and try to answer the question best.

S53, for example, explained that "this person, he or she, put a lot of thought into it, which I thought it was really sweet that someone would look at this and be like, "Oh, I really want to help this person."" In a similar vein, S11 said that an answer indicated that "it wasn't someone who was just trying to post something to get points."

Some participants pointed out that the fact that the answerer tried to help them by providing answers in a thoughtful manner itself was meaningful regardless of whether those answers turned out to be helpful or not. S60 expressed her appreciation to an answerer although the answer provided was not that relevant, stating that "they were trying to be helpful and I could tell the intentions were good, so I put a thumbs up for it."

b. Niceness

Another criterion considered by participants in the process of credibility assessment was how nice the answerer was in answering their questions. Participants found answers that did not show a negative demeanor such as rudeness, sarcasm, and condescendingness sincere. For example, S05 said that "she answered every question in a really good way and was polite about it." S77, similarly, stated that "his tone was very respectful and it wasn't at all pushing his views on me."

Including a statement of encouragement or good wishes also made participants think the answer more sincere, enhancing the likability of the answerer. S48 indicated that she liked the fact that an answerer said "Hope it goes brilliantly," in a response to her question about theater company auditions. S76, who had a question about his swollen finger, appeared to appreciate concerns expressed by the answerer as he stated that "they also wrote it in a friendly tone, 'Better to be safe' so sounds concerned." Likewise, S77 who asked a question about Beijing's pollution in relation to her summer trip to Beijing, explained that she liked an answer she received because "he said, 'You're visiting in

summer and you're staying there for a short time, so you'll be fine; but be careful.' So, he took kind of a nice tone in his answer."

c. Effort

Participants acknowledged how much effort was deemed to be invested in an answer when determining the credibility of the answer. They appreciated it when those who answered their questions put in effort doing research, synthesizing information, and writing the answer, and viewed such effort as a sign of the answerer's sincerity.

S07 indicated that "it just looked like this guy put a lot of time into actually going out and finding the information for me and then copying and pasting it into here." S09 also described the effort invested by the answerers, saying that "they went beyond what I was asking, which shows service … they really took the time to [answer my question]." Similarly, S63 said that "it looked like they put more time into it," considering that the answer contained a lot of information.

As discussed above, participants looked at the signs of effort invested by the answerers as they believed that those who put effort into answering their questions were sincere, and thus they could consider the answers provided by those people credible. Therefore, answers that showed a lack of effort were perceived as being less credible. The most commonly mentioned case was when answers contained links only and offered no description in relation to the links.

For example, S57 complained that "I didn't really like how it sent you to a different link." She further explained that "it would have been nice if they summarized the information and then gave me the link if I wanted to go find it myself." S21, similarly, expressed his preference toward information written in words rather than a pointer to a link. She explained that "I would prefer that they just told me what they could find on the links because sometimes when they send you to a different link, it's kind of a lazy person's way of saying, 'Just look here,' instead of giving me the information themselves. Because I guess if I really wanted to, I could have just searched in general on Yahoo! or Google or something and found it myself."

It seemed that some participants came to Yahoo! Answers because of the fact that they could get information with value added by real people. S70 stated that "I feel like the purpose of asking Yahoo! Answers is to avoid the researching and just to get the

direct feedback." Similarly, S23 indicated that "I think it was nicer to see it in someone else's written words than to take me to a different link that I could have found online probably." S44 also mentioned that "when people post other links, it's like, 'I could have searched that.' So when I go to Yahoo! Answers, I just want the answer right there."

d. Being Spam-Free

Whether the answer was spam-free, containing no information having an intention of phishing or advertisement, was also considered by participants when assessing credibility. While participants usually found specific information such as links or brands included in the answer useful in that such information could serve as source of the answer and support for the answerer's argument, some participants recognized that the reliability of such information mattered when it came to credibility.

Some participants were aware that certain types of links were not reliable based on their previous online experience and found answers containing such spam links not credible. For example, S26 stated that "I am very doubtful of people giving me websites since I didn't ask for a website, then when people give me a website, it gives me an idea that people are trying to promote their service or their business." In a similar vein, S69 argued that "It was spam. And I didn't know if it was spam or what, like, 'Hey, I can share with you this e-book.' It just didn't sound like I could trust them. It sounded like a scam or a virus." She further explained that "if they really wanted to, they could have taken a small paragraph out of the e-book that they had and pasted it on here or something or like taken a picture of it and put it on there, but they didn't. I feel like they were trying to send me a virus or something on that e-book."

Participants sometimes considered certain recommendations provided in an answer unreliable because they suspected that the answer was some type of promotion or advertisement. S55, who asked a question about shampoo for dyed red hair, expressed her doubt about an answer, saying "she said that she got 'em online, but I didn't like it as much because I feel like it's kind of like advertising like I feel like you're this specific and you didn't give me a bunch of different brands."

4.4.2.7 Validity Construct

The last and the most important construct that defines credibility in the Yahoo! Answers setting is validity. Validity is defined by terms such as "well-grounded" and "supported." Specifically, the dimension of validity refers to how well an answer is substantiated.

When it comes to credibility in this setting, participants appeared to put the highest priority on whether the answer contained evidence to prove what was said in the answer. Specifically, whether the source of information was included or not mattered most. The following quote by S20 well describes the significance of the source in relation to credibility:

> In this setting since you don't know who the other person is, sources and where they found their information from is important and maybe where they were educated or how they came across their knowledge, but that's also answered with a source. I think it just really boils down to a source.

S24 also recognized the importance of the source, stating that he found an answer credible if "they are confident enough with their answer to provide where they got it from and also showing that they did the background research and stuff."

Validity can be achieved in various ways. An answer may contain the answerer's firsthand account, background information, or links to other resources that indicate the answerer's research or knowledge. For instance, S02 stated that "if they write where they got their information and their source or explain something about their background that helps their credibility." Similarly, S40 stressed that it was important to indicate "where the person's answer is coming from." She further described that whether it was coming from "grounded research" or from "reliable personal information or scientific data" mattered.

It seems that the degree of participants' belief concerning the evidence provided in an answer varied depending on what type of evidence it was. Participants tended to consider links to external resources more convincing as long as those resources turned out to be credible as well. The provision of external resources confirmed that the answer was not made up or just based on opinions with no support by showing that there were other resources that said the same thing. S10, for example, stated that "I can trust that more if he has such an evidence to prove what he is saying."

With respect to the use of personal experience or knowledge as evidence, however, there were mixed reactions among participants. Some participants appreciated the fact that an answerer indicated the source in the answer itself. S21 said that "it's always really nice to see people who give a source and even if they just say 'knowledge about this topic,' I know that they took the time to say that they had the knowledge, so I would take that as pretty credible." On the other hand, some participants expressed reservations regarding personal experience and knowledge presented as the source of the answer. For instance, S57 acknowledged the importance of the source, saying that "I would say if someone provides a source for why they are saying what they're saying, that's a lot more credible." However, she added that "I have seen people write 'Source' and then put 'Knowledge,' which is far less credible." Similarly, S62 said that "I really don't think that there is much credibility unless someone cites a specific source that they use. I mean some may be talking about their experiences, but we don't really know if it's true or not, so it's kind of hard to judge on the Internet."

4.4.2.8 Criteria Associated with Validity

In relation to the construct of validity, participants looked at sources and congruence in order to assess the credibility of information they obtained from answers.

a. Source

Nearly all participants emphasized the presence of sources in an answer when it came to credibility assessment. They found answers that clearly indicated where information came from by citing the source more credible.

For instance, S09, who appreciated the source provided by an answerer, argued that "if someone else had written all of that information and didn't say it, I would be like, 'Well, how do they really know?' And so this was sort of like a proof." Similarly, S33 said that he found an answer credible because "he cited the source, which is something a lot of people don't do." S77 also stated that "he has sources, so it's not just him spouting his own beliefs like just without any backup. He does a good job of arguing his point, I feel like, so I felt like that was a very valid answer."

A variety of information including other online resources and the personal experience of answerers was recognized as valid in terms of sources. S64 explained that

"he provides links from where he's done research … and they're like credible sources, too. You look at The Atlantic here and you look at a site from University of California Berkley right here, and you look at another thing from Warwick's so they're pretty credible resources." S48 indicated that "she gave a source: her daughter studies at an acting school, so I knew she understood what it would take to audition for a theater company." Similarly, S42 stated that "they have experience and they have lived in a dorm. And they were talking from personal experience, so I just thought that was pretty cool."

It is noted that for a source to be effective, it should be perceived as credible by participants as well. Participants used their prior experience to determine the credibility of sources provided in an answer. S23 indicated that "I found the source to be credible that they posted because it was from ESPN.com, which is a very respected name." Similarly, S17 said that "this was from a .edu, so it was reputable." S65 also liked the fact that an answer provided information about "where exactly it came from." He further explained that "he mentioned that it's from his anthropology professor, so that gave his answer a much more—what's it called?—legitimacy, I suppose."

In addition to including the source of information in the answer, the answer's validity could be established through the provision of evidence that supported what was said in the answer. When presenting one's own opinion or inference, answerers could back up their statements by referring to other resources that were in line with the answerer's claim.

For example, S47 thought an answerer provided her with links because "it made him seem like, 'My response isn't just what you should go off of, but you should also look at these resources to back up what I'm saying.' So it kind of made him seem more credible." S39, who asked a question about ways to become a better climber, favored a response he received, stating that "he talked about using your legs and then followed that general statement with some background information or whatever. He talked about body positioning and then supported it with that, and then he's talked about other things and then supported that with evidence."

b. Congruence

Participants also considered answers that agreed with their knowledge as being credible, as congruence established the validity of the answers. Participants' knowledge could come from experience, observation, or research, among other possibilities.

For example, S21 explained that the reason that she found an answer credible was that "I did actually have a conversation with my dad about this before and … when I got this response, it concurred with what he said about how I should take care of my phone." S33, who was familiar with the subject he asked about, thought an answer was credible because he agreed with "everything he said." Similarly, S62 expressed his confidence in credibility of an answer, stating that "I did the previous research and they kind of said the same things so I know that it's not fake answers." S80 shared the same sentiment, saying "I did agree on some parts of it. So just having a foundation of I agree on some counts of their response would make me more inclined to accept whatever else they said."

It appeared that participants' own knowledge played a more important role in the process of credibility assessment. Some participants believed that verification based on their knowledge would be enough and no additional evidence that supported an answer was necessary. S04, for instance, found an answer credible even though it did not provide the source because it agreed with her knowledge. When asked about the credibility of the answer, she stated that "it's hard to say because they don't say where they got the information around, but I think for me I heard it was like 100 anyway based on previous knowledge, so I think it was credible because it came close to that number."

4.4.2.9 Summary

In the Yahoo! Answers setting, credibility is constructed based on four dimensions: pertinence, expertise, sincerity, and validity. While expertise and sincerity are in line with traditional constructs of credibility, pertinence and validity are newly identified constructs in this setting. Pertinence, which refers to whether an answer pertains to the question, is considered a fundamental construct of credibility. Expertise relates to how knowledgeable an answerer sounds based on an answer, and sincerity addresses the perceived well-intentionedness of the answerer. Lastly, validity, which relates to how well the answer is substantiated, is viewed as the most important construct of credibility given that people interact with people they do not know in this setting.

For each credibility construct, specific criteria used for credibility assessment were identified. With regard to pertinence, participants considered applicability, novelty, and diversity of an answer in the process of credibility assessment. With respect to expertise, participants found answers that were experience-based, thorough, well-written, and reputable credible. In relation to sincerity, answers that showed the answerers' seriousness, niceness, and effort, and that were spam-free, were considered credible. In relation to validity, participants viewed answers that indicated the source and agreed with their knowledge credible.

Chapter 5

Discussion

This study examined one particular social Q&A service using a social search framework. It investigated people's information-seeking behavior and credibility assessment practices in the Yahoo! Answers setting, with an emphasis on studying individuals' interactions with a large number of unknown people. The study analyzed people's perceptions of Yahoo! Answers in terms of its characteristics, benefits, and costs, and the various ways in which people use it to seek information. It also examined the ways in which social search practices in the Yahoo! Answers setting were shaped by characteristics such as goals, expectations, question-formulation strategies, and perceived outcomes. The social aspects of credibility assessment in the context of Yahoo! Answers were accessed by identifying various characteristics of credibility assessment, credibility constructs, and criteria used for assessing credibility.

This study focused on individuals' information-seeking and credibility-assessment behaviors in one social Q&A service that is community-based, general-purpose, and free. This is an online setting that involves asynchronous and anonymous interactions at a massive scale between a person who seeks help and a large number of unknown people who might potentially provide help. Though limited to one particular social Q&A service, the study's findings have implications for other social Q&A services that share characteristics with Yahoo! Answers. In addition, the study's findings have implications for other online settings that offer people an opportunity to reach out to a large number of unknown people for information and assistance.

Specifically, this study makes several important contributions to information behavior and credibility research. First, it provides insights into the social dimension of information seeking on the Web by identifying the positive effect of human curation enabled by a social Q&A service on the process of information seeking. It was found that people appreciate the value added by the human curation in a social Q&A setting. Such

curation allows them to receive personalized information without losing opportunities for serendipitous discovery. Studying participation in a social Q&A service from the information seeker's perspective also revealed the various ways in which people use such services—for example, not just to post questions themselves, but also to search an archived collection of questions and answers. The identification of this versatile use of a social Q&A service suggests that information behavior researchers might want to broaden their focus beyond people's goal- and task-oriented searching to include information seeking enacted "for fun." The study also demonstrated that social interactions with a crowd serve as an additional layer mediating the process of credibility assessment in a social Q&A setting. It identified three characteristics of credibility assessment (i.e., relativeness, crowd-assistedness, and transientness) and added two new credibility constructs (i.e., pertinence and validity) to traditional credibility constructs (i.e., expertise and trustworthiness).

This chapter first provides a recapitulation of this study's main findings around the following three themes: (1) personalization with opportunities for serendipitous discovery, (2) versatile use of a social Q&A service for social search, and (3) addition of a social layer to credibility assessment, followed by a summary of key findings. It then closes with a discussion of the study's limitations.

5.1 Discussion of Major Findings

5.1.1 Personalization with Opportunities for Serendipitous Discovery

The findings from this study provide insights into the social dimension of information seeking on the Web by identifying an important benefit derived from human curation enabled by a social Q&A service. A social Q&A service allows people to obtain personalized information without limiting opportunities for a serendipitous discovery of information because the information provided in the form of answers from the crowd is curated by real people. Given that participants were fully aware that they interacted with a large number of people they did not know, they recognized that the use of a social Q&A service entailed several costs such as uncertainty in terms of the likelihood and timeliness of getting answers to their questions, and potential variance in the quality of the answers.

However, it appears that the benefit of human curation overrides such costs in that participants indicated great appreciation of the value it added.

First, the value of a social Q&A service as an information source that provides personalized information was reaffirmed. Participants' appreciation of personalized information was consistently found throughout the process of information seeking using a social Q&A service. When posting their questions, people appeared to assume that those who would answer their questions would actually read those questions and try to interpret them in order to identify what they were looking for. Thus, they expected to receive answers that were tailored for them, that included concrete information such as examples or links they actually could use, and that would be comprehensibly written in everyday language. Once they received answers, people perceived that they gained a number of results in relation to personalization, not only from information contained in the answers provided by other people but also from the experience of interacting with those people. An informational outcome from personalization was captured in the current and future usefulness of information obtained from answers that considered the circumstances of those who asked the question. People perceived that their search was successful when they received personalized answers that guided them in the right direction for further research by narrowing down what to look for, when they gained information such as links to other websites that they would consider using later, when they were able to get confirmation of an existing belief from other people, or when suggestions or solutions contained in the answers actually worked for them. Participants also obtained a social outcome from personalization when they were able to recognize that those who answered their questions actually paid attention to their questions and understood what they were looking for.

The second value added by human curation was a serendipitous discovery of information. The findings from this study demonstrate that a social Q&A service not only enables provision of personalized information but also offers opportunities for a serendipitous discovery of information. The study found that people valued serendipity when it comes to informational outcome. Specifically, people considered their search successful when answers pointed out aspects they had not previously considered in relation to the subject of interest, and when they gained extra information from answers

that they had not specifically asked for but that turned out to be relevant and useful. Participants' appreciation of serendipity in the process of information seeking was also demonstrated by the fact that they viewed potential differences in interpretation of their questions among those who would answer them as beneficial in that this might result in diversity in the answers and ultimately a chance to make an unexpected discovery. Such serendipitous discovery may be even facilitated by the heterogeneous nature of a social Q&A setting because the more people participate in answering, thanks to the ease of entry, the more likely askers are to receive diverse answers.

Furthermore, the fact that diversity and novelty were highly considered across various dimensions including benefits, expectations, and informational outcome seems to attest to people's implicit desire for opportunities for a serendipitous discovery of information when they favor personalization offered in this setting. People acknowledged the capability of a social Q&A service to connect them with people who were not in their social network and not in their own cultural boundaries in that this would lead to a higher chance to obtain diverse and novel information. It was also found that people expected diversity in the answers that could come from either a large number of answers that represented different opinions or from an answer that contained multiple options, and novelty of answers that might come from the potential uniqueness of information provided by the crowd. These expectations were mirrored in informational outcomes perceived by participants in that they found their search successful when they received multiple answers from different people, and when they received answers that allowed them to gain a variety of opinions on a subject.

In recent years, there has been a growth in concern over the potentially negative effect of personalization of Web search in that it may limit the possibility of being serendipitously exposed to information that would turn out to be relevant or useful when search results are provided based on personalization algorithms (André, Teevan, & Dumais, 2009; Hannak et al., 2013; Nagpal, Hangal, Joyee, & Lam, 2012). Such concern is also captured in the term 'filter bubble,' introduced by Pariser (2011). The findings from this study demonstrate that in a social Q&A setting, personalization does not necessarily play a negative role in the process of information seeking by limiting opportunities for exposure to diverse information because personalization in a social

Q&A setting is enabled by real people instead of algorithms. This value of a social Q&A service as a search system that enables personalization as well as serendipitous discovery deserves further research.

5.1.2 Versatile Use of a Social Q&A Service for Social Search

The examination of a social Q&A service from the information seekers' perspective allowed the identification of more versatile ways of using a social Q&A service in the process of information seeking in that people not only used it as a platform to post questions themselves but also used it as a kind of a Web search system like Google to access a collection of accumulated questions and answers.

With regard to the use of a social Q&A service for a questioning purpose, this study has made a contribution by identifying strategies and tactics that people used to formulate their questions in order to convey what they were looking for to potential answerers whom they did not know. A few studies have examined the effect of an asker's attitude, such as an indication of effort or gratitude when posting a question on the quantity and/or quality of answers (Gazan, 2007; Harper et al., 2008; Yang et al., 2010). However, little work has been done to investigate how people actually formulate their questions in the process of posting a question themselves to a social Q&A service. It was found that participants considered two aspects, quantity and quality of answers, when formulating questions, and employed strategies either to increase the quantity of answers or enhance their quality, depending on what they wanted to obtain from the answers. Specifically, if they wanted to receive better answers, they utilized strategies of narrowing down options, contextualization, and targeting a specific audience. If they wanted to receive more answers, they broadened questions to lower barriers for potential answerers and to attract their attention. It is noted that this is not a matter of dichotomy, but of a degree, as participants demonstrated different patterns of question-formulation strategies depending on their search goals. When participants aimed to gain knowledge or skill for personal development or to solve a problem, they tended to pursue the quality of answers by making their questions specific. In contrast, they tended to focus more on broadening their questions to get more answers when they wanted to receive help with school-related work. Those who posted a question to make a decision seemed to use a

mixed strategy in the hope of receiving both a good number of answers and answers of decent quality.

In addition to using a social Q&A service as a platform for asking questions, people used it as a search system that enabled them to access a collection of accumulated questions and answers. Almost all participants were found to commonly search existing questions instead of posting a question themselves as they viewed a social Q&A service as a huge collection of archived questions and answers that contained people's thoughts about any topic. It appears that by searching for existing questions instead of posting a question themselves, people attempt to avoid costs associated with the use of a social Q&A service as a platform for asking questions while still enjoying the benefit of saving time and effort and getting diverse answers from a large number of people they do not know. Participants explained that they searched for existing questions and answers because there was no guarantee of arrival of answers in the first place, much less of the timeliness of their arrival. In addition, people considered searching for existing questions a more efficient way of obtaining quality answers in a setting where the quality of answers varies because they could compare multiple answers to multiple similar questions.

The identification of use of a social Q&A service not only as a platform to ask a question but also as a search system to access a collection of questions and answers also reveals that a social Q&A service serves as a venue for *searching for fun*. This study found that the most common type of goal that participants tried to achieve when using a social Q&A service to post a question themselves was to satisfy curiosity. It seems that the ease of use of a social Q&A service facilitated posting curiosity-based questions that tended to be spontaneous, as curiosity was motivated suddenly by a wide range of daily activities such as classes, conversation with friends or family members, and consumption of TV shows or news articles, as well as by people's long-held interests. Furthermore, for some participants, a social Q&A service served as a setting where they conducted searches for entertainment, without any particular goal of getting a good answer to their question but simply to enjoy browsing and reading questions and responses that others had posted. In the field of information behavior and computer supported cooperative work, some researchers have been paying attention to affective aspects of information

seeking, positive ones in particular, that could cover searching for fun in a broader sense with the goal of understanding people's information behavior from a holistic perspective (Brown & Barkhuus, 2007; Fulton, 2009; Kari & Hartel, 2007). However, previous work that has examined pleasure-oriented information seeking has tended to be done in the context of leisure such as hobbies (Fulton, 2009; Hartel, 2010). Little work has been conducted to specifically examine searching for fun in the sense of "the activity of interacting with an information system without having a specific search objective in mind" (Agosti, Fuhr, Toms, & Vakkari, 2013, p. 119). The findings from this study introduce a social Q&A service as a new context in which searching for fun can be investigated, and this may help enhance our understanding of information behavior in a social Q&A setting from the information seeker's perspective.

5.1.3 Addition of a Social Layer to Credibility Assessment

By characterizing social aspects of credibility assessment in the context of interacting with a large number of unknown people and identifying new credibility constructs that are applicable to a social Q&A setting, this study provides insights into the effect of social interactions on credibility assessment. A fundamental assumption held when it comes to credibility in a social Q&A setting was that credibility was found in the answer (i.e., what was said in the answer) not in the answerer (i.e., who the answerer was). Participants' clear awareness that it was a large number of people they did not know that they were interacting with seemed to make them mostly pay attention to answers rather than those who answered their questions. They felt little or no need to learn about who the answerer was, given that any credibility assessment in a social Q&A setting is transient in that it depends on the context of each search episode. Every search episode was different as people had a different goal to achieve, sought different types of information about different subjects, and interacted with different subsets of people who actually answered the question or left feedback on the answer through votes or comments. Therefore, the perceived significance of credibility and criteria that people use to make credibility judgments have to vary depending on the context of each search episode.

This transient nature of credibility assessment based on the fact that interactions take place with different groups of people in each search episode relates to another

characteristic of credibility assessment in a social Q&A setting: relativeness. In each search episode, these interactions with different groups of people are represented as different ranges of answers and different arrival times of answers. In a social Q&A setting, it is likely that people will receive multiple answers to their question that will arrive nonsimultaneously. This allows them to compare these answers with each other, making credibility assessment relative. For example, an answer that could have been considered not credible in other situations could be considered credible if other answers are of lower quality than that answer, or if the answer that arrived before it is of lower quality.

The last and most important characteristic of credibility assessment in a social Q&A setting identified in this study is crowd-assistedness. People can get assistance from the crowd when assessing credibility by utilizing endorsement information and by cross-referencing answers. Endorsement in a social Q&A setting is represented by feedback on answers provided by other people. People can obtain endorsement information through both their own interactions with the crowd and others' interactions with the crowd. It was found that participants' credibility assessment was influenced by information indicating the crowd's endorsement, such as thumbs-up or thumb-down votes, and activity history of the answerer (i.e., the number of points, level status, top contributor badge, and the percentage of best answers). It is noted that despite their usefulness, only a very small number of participants actually utilized these various types of endorsement information. Furthermore, it was found that endorsement information could serve as a reinforcing factor that strengthened existing beliefs, but that it did not generate new beliefs in the process of credibility assessment. The presence of multiple answers to a question provided by the crowd also helped participants make credibility assessments by serving as a cross-reference. Participants found an answer that was consistent with other answers credible, viewing this as a consensus reached among multiple people. It is noted that cross-referencing can take place not only among multiple answers to one question that an asker posts, but also among multiple answers to multiple similar questions that can be found by searching a collection of questions and answers.

In addition to identification of characteristics of credibility assessment that address its social aspects, this study has contributed to credibility research by identifying

two new credibility constructs of *pertinence* and *validity* that were applicable to a social Q&A setting along with two traditional credibility constructs. The pertinence construct, which refers to whether an answer is specifically pertinent to the question, appeared to be fundamental in that participants considered pertinence a necessary condition that should be met in order for the answer to be credible. Furthermore, pertinence addresses the degree of personalization; thus, various dimensions of personalization, including an asker's capability to apply information provided in the answer to her situation, and the asker's level of familiarity with and knowledge about the subject, are considered when assessing whether the answer is pertinent or not. Specifically, it was found that the criteria used to judge pertinence include applicability, novelty, and diversity. When an answer was applicable to participants considering their circumstances, they found the answer credible, as it was pertinent to their question because it suited their needs. Applicability can take the form of either potential usefulness or proven usefulness. Given the knowledge that participants already possessed about a subject, answers that contained new information that participants could have not found on their own or ideas and perspectives that they had not considered were regarded as pertinent. Participants also found answers that provided multiple options that they could try more credible because the higher availability of options the answer indicated, the more tailored was the answer.

Along with pertinence, validity, which refers to how well an answer is substantiated, is another new credibility construct that was identified in this study. The construct of validity was considered most significant by participants, with nearly all participants stressing the importance of the presence of information that supports an answerer's statement in the answer. This seems to be attributable to participants' awareness that they were interacting with people they did not know. It was found that two criteria, source and congruence, were used to determine the validity of an answer in the process of credibility assessment. Participants found answers that clearly indicated where information had come from by citing its sources credible. Indication of a source can be made explicitly by completing a source section offered by the system as an option for answerers, or information about the source can be incorporated into the content of the answer. Participants accepted an answerer's firsthand account, experience, and background as legitimate sources, although they considered these difficult to verify with

factual information. In addition to subjective sources, objective sources such as links to other online resources were found legitimate. Whether an answer agreed with the asker's previous knowledge was another criterion that participants used to assess the validity of an answer. Participants utilized a wide range of knowledge that was based on their own experience, research, observation, and so on, to determine validity.

Two traditional constructs of credibility, expertise and trustworthiness, were found to remain applicable to a social Q&A setting. In a social Q&A setting, expertise refers to whether an answerer is knowledgeable about a subject. It is noted that in this setting, one's expertise can not only be enhanced by professional knowledge or qualifications, but also by personal experience. In determining expertise, participants paid attention to four criteria: being experience-based, being thorough, being well-written, and reputability. An answer that contained information indicating personal experience was considered credible because participants considered this to be proof of the answerer's knowledge about the subject. Firsthand accounts, stories of someone else's experience, and background information about an answerer were accepted as evidence of personal experience. Participants also found lengthy answers credible because the ability to cover various points, elaborate, and provide detailed explanation with examples was equated with the possession of sufficient knowledge to answer a question well. The way the answerer wrote the answer and the answerer's reputability were also considered as indications of that person's expertise. In evaluating the way an answer was written, various elements in relation to the presentation and writing such as typos, grammar, language use, and structure of the answer were noticed by participants. This supports findings from previous studies that have reported the effect of presentation and writing style on people's evaluation of an answer (Kim, 2010; Kim & Oh, 2009). Reputability of the answerer was also determined by looking at a wide range of aspects that indicated activity history of the answerer, including a top contributor badge, number of points, level status, percentage of best answers, and the quantity and quality of answers provided in response to other questions. However, as discussed previously, only a very small number of participants took advantage of this history information when making credibility assessments.

In a social Q&A setting, the traditional construct of trustworthiness was represented as *sincerity*, which deals with how well-intentioned an answerer is in providing an answer to a question. Participants considered sincerity significant in assessing credibility in this setting although they understood that there could be trolls in a social Q&A setting as in any other online environment. Four criteria used to determine sincerity of an answer were identified. Participants found answers that demonstrated the answerer's seriousness, niceness, and effort, and that were spam-free sincere. They looked at whether an answerer took answering seriously because they believed that taking answering seriously indicated the answerer's sincerity in that those who were serious tended to actually read their question and try to answer it best. This not only better ensured the quality of the answer by potentially enhancing the degree of personalization but also ensured a more positive social outcome. Niceness of answers was captured by a polite and friendly writing style, a statement of encouragement or good wishes, or the inclusion of an emoticon. Furthermore, participants acknowledged lengthy answers, synthesized information, and inclusion of other resources in the answer as signs of effort invested by the answerers, considering such answers sincere. Lastly, an answerer's well-intentionedness was assessed by looking at whether an answer contained information that had an intention of phishing, promotion, or advertisement. While participants usually found specific information such as links or brands included in an answer useful because they could serve as sources of the answer and support for the answerer's argument, they were cautious about accepting this kind of information due to the possibility of spam.

The findings on specific criteria associated with each construct that was identified in this study provide support for previous work that examined information quality in a social Q&A setting (Kim, 2010; Kim et al., 2007; Kim & Oh, 2009). In addition, this study adds to the literature on credibility by identifying new credibility constructs that capture the characteristics of social search using a social Q&A service. Specifically, the pertinence construct deals with the characteristics of interacting with a large number of people, while the validity construct addresses the characteristics of interacting with strangers. These findings may help designers of social Q&A services identify what aspects of credibility they want to focus on when developing features that support

credibility assessment in this setting by providing insights into what specific dimensions people consider when developing credibility perceptions.

5.1.4 Summary

In a social Q&A setting, those who ask questions directly and indirectly interact with a large number of unknown people in the process of seeking information. They can interact directly with a number of different people by receiving multiple responses to a posted question, or they can engage indirectly with a number of unknown people by receiving feedback in the form of votes or comments on the responses they received. One of the key findings of this study is that these social interactions have a beneficial impact and positively influence the process of seeking information by enabling people to obtain personalized information pertaining to their needs, while still allowing for serendipitous discovery given the diverse ways in which respondents may interpret questions.

Although this study originally focused on how people use a social Q&A service as an information source by posting questions themselves, the results reveal that people use this space in a variety of ways—not only to post questions themselves but also to search a collections of accumulated questions and answers. Further, when people come to a social Q&A service, they do not always look for answers to their questions. Sometimes, they come simply to engage in "searching for fun," asking random questions out of curiosity or browsing and reading others' questions and answers.

This study also captured social aspects of credibility assessment in a setting where interactions with a large number of unknown people takes place by identifying distinctive characteristics of credibility assessment and credibility constructs. The study found that social interactions add an additional layer to credibility assessment, resulting in the distinctive characteristics of relativeness, crowd-assistedness, and transientness, along with new credibility constructs of pertinence and validity, in addition to the more traditional constructs of expertise and trustworthiness. These findings provides insights into how social interactions shape the way people assess and conceptualize credibility, which could, in turn, enhance our understanding of credibility assessment in other online settings enabled by social technologies. Figure 6 presents a summary diagram of these key findings.

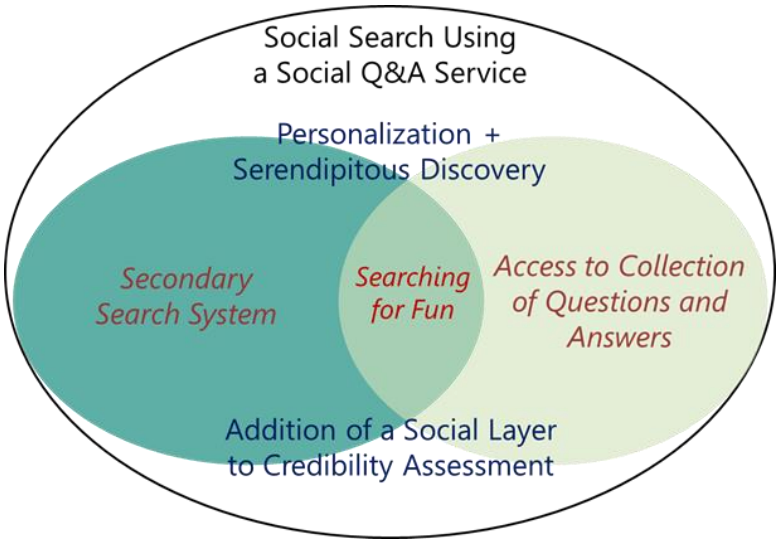

Figure 6: Summary Diagram of Key Findings

5.2 Limitations of the Study

This study has several limitations. The recruitment of undergraduate students as participants might have resulted in sampling bias. Although I was able to recruit current users of Yahoo! Answers, participants might have not been representative of Yahoo! Answers users. With respect to the Yahoo! Answers Level (Level 1 to Level 7) that is assigned to users based on users' points that represent how actively they have been participating, the majority of participants were at lower levels, with 83% being at Level 1 and 10% being at Level 2. There is a possibility that the perceptions and behavior of those who were relatively less active might have differed from the perceptions and behavior of those who were at higher levels with more points. In an attempt to address this issue, I tried to maintain the same level of activity at least for the duration of the study by instructing participants to post the same number of questions during the same period assigned to them.

Artificiality was introduced as participants were instructed to post five questions to Yahoo! Answers during a period of one week. Although they were encouraged to post questions on any topic that they were interested in and at their convenience, participants might have been selective when posting their questions to Yahoo! Answers in order to present themselves in a socially desirable light. Furthermore, the fact that participants

were encouraged to spread questions out over the period of one week might have affected the likelihood of getting answers to questions they posted and the ultimate number of answers they received, as a question that was posted later the week had less time to get answers and thus was less likely to receive more answers than questions posted earlier in the week. This might have affected participants' perceptions of the social Q&A service, search outcomes, and credibility. As mentioned earlier, this artificiality was necessary in order to remove potential variance in participants' activity level during the study period.

This study relied on self-reported data, which might have limited the accuracy of responses provided by participants. Specifically, self-report could lead to bias due to researcher expectancy effects. My preconceived notions about information evaluation behavior could have influenced participants' responses because they may have tried to provide answers that they believed I was looking for. In an attempt to prevent this bias, I purposefully did not mention credibility-related issues during the introductory meeting, and strove to present questions in an open-ended and neutral manner during the interview. However, as participants were asked to answer a number of the same questions about credibility for each question they posted during the interview, they could have inferred the researcher's purpose and tailored their answers accordingly.

Selection of one particular social Q&A service as a study venue may limit generalizability. Although Yahoo! Answers is a representative social Q&A service with the largest number of users, the offerings, implementation and mechanisms of features are different from one service to another, despite basic similarities. Furthermore, during the data collection period, Yahoo! Answers removed a feature that had allowed its users to share a question via email or other social network sites such as Facebook, Twitter, Tumblr, and Google+. Although this feature was not directly related to the task of posting questions and it seems that no participants had used this feature, this unexpected change in feature may have influenced participants' behavior on Yahoo! Answers indirectly.

Chapter 6

Conclusion

This chapter presents the theoretical, methodological and practical implications of this study, suggesting several implications for design of social Q&A services. Suggestions for future research in this area are then discussed. The chapter closes with concluding remarks.

6.1 Theoretical Contributions

This study makes a number of contributions to research on information behavior, social Q&A services, and credibility. The results from this study show that interactions with a large group of unknown people that take place in a social Q&A setting allow for the provision of personalized information without limiting possibilities of serendipitous discovery of information as personalization is enabled by human curation. This finding helps us to further expand the discussion of information seeking as a non-solitary activity by providing insights into how social interactions come into play in the process of information seeking on the Web as a means to overcome the potential negative effects of personalization powered by algorithms.

Furthermore, the findings from this study add to the literature on social Q&A services by offering new perspectives towards understanding a social Q&A service as information source. By investigating a social Q&A service from the information seeker's perspective instead of the information provider's perspective more commonly found in previous studies, this study discerned that the use of such a service in the process of information seeking serves various purposes other than posting questions to seek information. People often use a social Q&A service as a search system to look for information among a collection of accumulated questions and answers. Moreover, the service offers a setting for people to simply engage in searching for fun, enjoying the experience of being exposed to diverse information. More research on these different

roles served by a social Q&A service in the information seeking would provide a more holistic understanding of individuals' information behavior taking place within a social Q&A setting. For example, more work specifically focused on people's use of a social Q&A service as a search system to access a collection of questions and answers may help us understand how people differently seek information when they use a social Q&A service to search a collection of accumulated questions and answers and may help us identify different dimensions of people's information seeking, especially in relation to information seeking through the help of others' interactions with the crowd. This could also provide some initial insights into another dimension of social search in this context by focusing on indirect interactions instead of the direct interactions that take place in the form of asking questions themselves.

This study contributes to credibility research by introducing new concepts for understanding social aspects of credibility assessment. The findings that credibility assessment in a social Q&A setting can be characterized around three aspects of relativeness, crowd-assistedness, and transientness, and that new credibility constructs such as pertinence and validity can be applicable to a social Q&A setting provides insights into the effect of social interactions on the process of credibility assessment. These interactions add another layer of credibility assessment, which addresses both optional information that could be attached to an individual answer, such as feedback given by other users to answers such as votes or comments, and an entire range of answers provided by multiple answerers, to the assessment usually made at an individual answer level. These newly added concepts help us further explore social aspects of credibility assessment not only in a social Q&A setting but also in the context of other social technologies in a broader sense.

6.2 Methodological Contributions

This study makes several methodological contributions to information behavior research and research on social Q&A services. First, the creation of a rich collection of questions and responses to those questions, representing a variety of search episodes emerging from people's daily lives was made possible by gathering data on participants' information seeking using a social Q&A service in situ. Instead of assigning pre-designed search tasks to participants, a method commonly found in information behavior research,

this study instructed participants to post questions on any topic that they were interested in at their convenience, and this allowed the research to capture data on information-seeking episodes based on people's actual information needs in natural settings.

This study also makes a methodological contribution to research on social Q&A services in that data about what askers were looking for when posting questions and how askers perceived the quality of the answers they received was collected directly from those who asked the questions. Previous studies have mostly used the texts of questions crawled from a social Q&A service to identify types of questions; this approach has limitations in that it does not capture nuanced information about the context behind the question. In this study, by collecting the accounts of those who asked questions along with the texts of their questions, it was possible to gain more nuanced information about what askers were really looking for when posting questions. In a similar vein, collecting data drawn from participants' first-hand experience using a social Q&A service was important with respect to understanding people's information evaluation practices in that setting. This study enabled the collection of in-depth data about the evaluation of the quality of not only answers that were selected as the best but other answers as well by collecting data on how people assessed the quality of each answer to their question. This approach allowed the researcher to gather more nuanced and contextually rich data about people's information evaluation practices in a social Q&A setting compared to a method commonly found in prior studies on answer quality that uses the limited data available only for best answers (i.e., a numerical rating and a brief comments attached to the answer selected as the best) or ratings assigned by third parties (e.g., researchers or research assistants) as proxies for answer quality.

6.3 Implications for Designing Social Q&A Services

This study has produced several suggestions for designing social Q&A services. These can be discussed around three themes: facilitation of the use of a social Q&A service as a search system to access a collection of knowledge, support for better question formulation, and support for better credibility assessment.

Facilitation of the use of a social Q&A as a search system to access a collection of knowledge

The results from this study indicate that it is common for people to use a social Q&A service not only to post a question themselves but also to search a collection of accumulated questions and answers. This underscores the archival value of questions and answers stored by a social Q&A service as a collection of human knowledge. A number of studies in the field of information retrieval have examined how to better algorithmically predict the quality of questions posted to a social Q&A service and detect the questions that have potentially high archival value (Anderson et al., 2012; Harper et al., 2009; Shah & Pomerantz, 2010). The findings from this study may add insights into ways to further enhance the archival value of the content of both questions and answers by providing designers of social Q&A services with ideas from the information behavior perspective.

To promote the archival value of questions posted, a social Q&A service could provide more proactive assistance during the stage of question formulation. In the case of Yahoo! Answers, it currently provides suggestions for similar questions when people start typing their questions. However, this feature is more intended to prevent people from posting questions that have been already posted by other people. Therefore, a social Q&A system may come up with more specific ways to help people actually modify their questions in a way that could enhance the archival value of the questions. In addition, preventing people from asking the same questions multiple times may actually work against the service because it could reduce the number of questions that appear when people search existing questions and answers, reducing the chances of crowd-assistance through cross-reference in the process of the credibility assessment.

Another design consideration for facilitating the use of a social Q&A service as a search system to access a collection of accumulated questions and answers is to develop a mechanism that assigns scores based on archival value to each question that receives answers and use those scores to decide the order of questions displayed as search results when people search for existing questions. In calculating the archival value of a question, data aggregated at the level of the entire set of answers to the question, such as the total number of thumbs-up/thumbs-down votes given to all the answers to the question, presence of the best answer selection, and view counts for the question could be used. Moreover, a social Q&A service could provide a feature that allows its users to sort

search results based on this archival value score. This would help people easily identify a question with high archival value when multiple similar questions with multiple answers are provided as a search result.

Better support for question formulation in a social Q&A setting

This study found that people employed different strategies when formulating questions based on the goals they hoped to achieve. Ultimately, by putting effort into formulating a better question, people try to help their potential audience get a better sense of who they are, what their situation looks like, and what they want. This suggests that a social Q&A service may help people succeed in achieving their search goals by better supporting question formulation. Currently, Yahoo! Answers offers an optional section for additional details along with a section for the question, encouraging people to add more information to get better answers and then let askers to categorize their question by selecting one category for their question. Given that people place different weights on either the quantity or quality of answers and use different strategies to increase either of them accordingly, a social Q&A service could provide additional features that allow users to articulate their needs, circumstances, and expectations when posting a question, in addition to currently available features. For example, a social Q&A service could add an optional step after the selection of a category that enables users to indicate the type of answers they expect. A list of different types of answers such as facts, advice, or recommendations could be presented, and people could select one if they want to further specify their question. Given the frustration expressed by some participants regarding the selection of category for their question because categories automatically suggested by Yahoo! Answers did not necessarily match what they actually wanted, the addition of features that would allow people to further articulate their needs in the process of question formulation could enhance people's search experience in a social Q&A setting.

Better support for credibility assessment in a social Q&A setting

One of the characteristics of credibility assessment in a social Q&A setting that were identified in this study was that people make credibility assessments with the help of the crowd, which takes the forms of endorsement and cross-referencing. While the significant role of the crowd's assistance in the process of credibility assessment was identified, in the case of aggregated endorsement information in particular such as a top

contributor badge, this study found that a very small number of participants actually took advantage of this information when assessing credibility because they believed that it did not necessarily relate to the credibility of answers. Thus, a social Q&A service might be able to better support credibility assessment by facilitating the use of such aggregated endorsement information. One way to promote the use of endorsement information would be to reduce people's uncertainty by providing ways for users to easily understand what the information represents and how it is determined, as this would help remove suspicions about its applicability.

This study also found that the construct of validity was considered most important in defining credibility in a social Q&A setting because people wanted to make sure that answers were well-grounded when they interacted with people they did not know. This suggests another design consideration for supporting credibility assessment in a social Q&A setting. Like a search engine showing social media streams from one's social networks that are assumed relevant to the searcher's needs, a social Q&A service could improve people's capability to assess the credibility of answers by automatically offering information they could use to determine the validity of an answer. Additional information that could facilitate people's decisions regarding validity could be presented by using a machine learning technique that automatically understands what was said in an answer and identifies whether the answer contains information that can substantiate it. Information that would be presented as an additional means to determine the validity of an answer could be extracted internally from answers to other similar questions previously asked or externally from other resources on the Web.

6.4 Suggestions for Future Research

The methodological limitations of this study could be addressed by future research. For example, conducting a similar study with a more diverse sample that is not limited to undergraduates and that represents a wide range of Yahoo! Answers level statuses, and that uses existing questions that participants have asked in the past instead of requiring them to post new questions, would allow us to examine individuals' behavior in a more natural manner. Moreover, it is not clear to what extent the findings of this study apply to other social Q&A services that share characteristics with Yahoo! Answers. Future research is needed on social search practices using different social Q&A services.

Another direction for future research is to examine potentials of a social Q&A service that have not yet been fully realized. The findings of this study indicate the significance of the archival value of content (i.e., questions and answers) in a social Q&A setting. As discussed earlier, while a small number of studies have focused on the archival nature of a social Q&A service and have addressed a social Q&A system's algorithmic ability to detect questions and answers that would have high archival value (Anderson et al., 2012; Harper et al., 2009; Shah & Pomerantz, 2010), little work has been done on this issue from the information behavior perspective. Thus, research on the use of a social Q&A service as a search system for a collection of knowledge from the information behavior perspective deserves further attention. This study also found that a social Q&A service could serve as a setting for searching for fun. Future research focusing on how people use a social Q&A service as a means of searching for fun would expand our understanding of people's information-seeking practices, especially in the everyday context. Considering the growing opportunities for casual search thanks to the advancement of various social and mobile technologies, more work that investigates how people conduct searches for fun in the context of social Q&A services is required.

Future research that further examines the social aspect of credibility assessment is also needed, not only in a social Q&A setting but also in other online environments enabled by various social technologies. This study identified the effect of social interactions that take place in a social Q&A setting on credibility assessment by capturing new credibility constructs along with traditional ones. It is unclear if these constructs apply to other online environments enabled by different social technologies that entail interactions with a large number of unknown people. Furthermore, by examining whether different criteria associated with these constructs would be identified in other settings, our understanding of the social aspects of credibility assessment could be expanded.

This study also attempted to identify design implications for social Q&A services. Another possible area of research might be to conduct an experimental study to identify the effects of different factors designed to support various dimensions of individuals' information behavior (e.g., use of question-formulation strategies and endorsement information) in a social Q&A setting. For example, by manipulating the way features that indicate endorsement, such as thumbs-up/thumbs-down votes, top contributor badges,

and the percentages of best answers are presented, the effect of different types of endorsement could be examined. Further research in this area, in particular, would help people take fuller advantage of the power of the crowd in the process of information seeking in a social Q&A setting.

6.5 Concluding Remarks

This study investigated how people use a social Q&A service in the process of information seeking using a framework of social search, with an emphasis on interactions with a large number of unknown people. The motivation for this study was to better understand social aspects of people's Web search behavior in online environments enabled by social technologies, including a social Q&A service. This study identified people's perceptions of a social Q&A service in terms of characteristics, benefits, and costs, and various ways of using a social Q&A service as an information source. It also characterized social search practices in a social Q&A setting around various dimensions including goals, expectations, question-formulation strategies, and outcomes. Furthermore, characteristics of credibility assessment in a social Q&A setting were identified, and the constructs of credibility and criteria associated with each construct were discovered.

This study's attempt to investigate social aspects of information seeking and credibility assessment in a social Q&A setting has resulted in several important implications for information behavior research and credibility research. With respect to information behavior research, the findings from this study suggest the significance of understanding the effect of social interactions on the process of information seeking, as human curation enabled by social interactions has the potential to further enhance people's Web search experience. With regard to credibility research, the results of this study help lay the foundation for expanding our understanding of online credibility assessment by adding new ideas and constructs that can be employed to investigate people's credibility assessment practices in other newly emerged online environments that often involve interactions with a large number of unknown people.

Appendices

Appendix A: Recruitment Flyer

Study on Online Question Asking

If you participate, you will be asked to use Yahoo! Answers for one week. At the conclusion of one week, a researcher from the University of Michigan School of Information will interview you about your experience using the site. The in-person interview will last about 1.5 hours.

To qualify you must be (1) at least **18 years old,** (2) currently enrolled as an **undergraduate student**, (3) a **current user of Yahoo! Answers** who has posted at least **1 question** to Yahoo! Answers over the last **3 months**.

Participate in a 1-week research study
and you'll earn $40

Interested? Please send an email to yjeon@umich.edu

1 Week Online Question Asking Research Study: yjeon@umich.edu
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Appendix B: Recruitment Email Message

Subject: Wanted Participation for Online Question Asking Study

Greetings!

My name is Grace YoungJoo Jeon, and I am a doctoral student in the School of Information at the University of Michigan. I am currently conducting a study about online question asking using Yahoo! Answers.

As a participant, you will be asked to use Yahoo! Answers for one week. At the conclusion of one week, I will interview you regarding your experience using the site. The in-person interview will last about 1.5 hours. In exchange for your time and effort, you will receive $40 if you complete the study, including the interview.

To qualify you must be (1) at least **18 years old,** (2) currently enrolled as an **undergraduate student**, (3) a **current user of Yahoo! Answers** who has posted at least **1 question** to Yahoo! Answers over the last **3 months**.

If you qualify and are interested in participating, or would like to learn more about the study, please contact me at yjeon@umich.edu. Please feel free to forward this invitation to any undergraduate student you think might be interested.

Sincerely,
Grace

Grace YoungJoo Jeon
Doctoral Candidate
School of Information
University of Michigan

Appendix C: Informed Consent Form

You are invited to participate in a research study about online question asking using a social question-answering site. This study is being conducted by Grace YoungJoo Jeon, a doctoral student in the School of Information at the University of Michigan. The purpose of the research is to investigate how people ask questions online using a social question-answering site such as Yahoo! Answers.

If you agree to participate in this study, you will be asked to fill out a background questionnaire. You then will be asked to use Yahoo! Answers for one week. During this period, you are expected to post one question per day to Yahoo! Answers, five questions in total. You are also expected to follow the question you posted, read the answers you receive, if any, and pick the best answer if applicable. You are also encouraged to ask questions you really have questions about rather random questions if possible. The question you choose to post may be on any topic that you are interested in. However, please keep in mind that your actual questions posted there will be discussed during an interview later.

At the conclusion of one week, I will interview you for about 1.5 hours. A reminder for the scheduled interview will be sent to you one day prior to the interview, and you are expected to reply to the reminder with a list of five questions you posted over one week. During the interview, we will talk about the questions you posted to Yahoo! Answers. With your consent, the interview will be audio-recorded, and what is on screen, including your questions, will be recorded using screen-capture software for further analysis. Even if you do not agree to be audio and screen recorded, you can still participate in this study. After the interview, you will be asked to fill out a post-interview questionnaire about your overall experience using Yahoo! Answers.

I do not expect that participation in this study will cause you any harmful side effects, psychological or physical discomfort, or expose you to risk. There is no direct personal benefit to you from participating in this study. However, the findings from this study will be useful for researchers, educators, information professionals, and Web users.

In exchange for your time and effort, you will receive $40 if you complete the study, including the interview and post-interview questionnaire. If you stop participating at any time prior to completing the entire study, you will still receive compensation of $5.

Your participation in this study is completely voluntary. Even if you decide to participate now, you may change your mind at any time and may choose not to answer any question for any reason. In addition, you are free to ask any questions about the study at any time.

You will not be identified in any reports on this study. Records will be kept confidential to the extent provided by federal, state, and local law. At the conclusion of this study, all data will be stored in a locked office for a period of three years for the future research use of the principal investigator and then will be destroyed. In order to ensure that the information you provide cannot be linked with your identity, this form will be kept separate from your study data.

If you have questions about this research study, you can contact the researcher, Grace YoungJoo Jeon, University of Michigan, School of Information, 3336B North Quad, 105 S. State St., Ann Arbor, MI 48109-1285, (734) 272-9916, yjeon@umich.edu or the

faculty advisor for the study, Soo Young Rieh, University of Michigan, School of Information, 4433 North Quad, 105 S. State St., Ann Arbor, MI 48109-1285, (734) 647-8040, rieh@umich.edu.

If you have any questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Boards, 540 E Liberty St., Ste 202, Ann Arbor, MI 48104-2210, (734) 936-0933, or toll free, (866) 936-0933, irbhsbs@umich.edu.

You will be signing on two copies of this consent form and will receive a copy for your reference.

(___) I have read the information above and I consent to participate in this study. I also affirm that I am 18 years of age or older and currently enrolled as an undergraduate student.

Printed name Signature Date

Please sign below if you are willing to have the interview portion of this study audio-recorded. You may still participate in this study if you are not willing to have the interview audio-recorded.

(___) I am willing to have the interview portion of this study audio-recorded.

Signature Date

Please sign below if you are willing to have on-screen activities including questions you posted recorded during the interview. You may still participate in this study if you are not willing to have on-screen activities recorded.

(___) I am willing to have on-screen activities including questions I posted recorded during the interview.

Signature Date

Appendix D: Background Questionnaire

1. Please indicate your gender.
   - Male
   - Female

2. What year were you born? [ ]

3. What year are you in?
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Other, please specify ( )

4. What are your areas of study? [ ]

5. How long have you been using Yahoo! Answers? [ ]

6. How do you access Yahoo! Answers? Check all that apply.

Computers	Mobile phones	Tablet devices	Other, please specify
☐	☐	☐	☐

7. How often do you engage in the following activities when using Yahoo! Answers?

	Never	Less than once a month	A few times a month	Once a week	2-6 times a week	Once a day	2-4-times a day	More than 5 times a day
Post a question to the site	☐	☐	☐	☐	☐	☐	☐	☐
Answer a question asked by someone else	☐	☐	☐	☐	☐	☐	☐	☐
Rate someone else's answer	☐	☐	☐	☐	☐	☐	☐	☐
Comment on someone else's answer	☐	☐	☐	☐	☐	☐	☐	☐
Follow someone else's question	☐	☐	☐	☐	☐	☐	☐	☐
Search existing questions and answers	☐	☐	☐	☐	☐	☐	☐	☐
Browse existing questions and answers	☐	☐	☐	☐	☐	☐	☐	☐
Other, please specify ( )	☐	☐	☐	☐	☐	☐	☐	☐

8. Have you ever used any of the following online question-answering sites? Check all that apply.

Answerbag	Answers.com	Askville	Ask Metafilter	Quora	StackOverflow	Other, please specify
☐	☐	☐	☐	☐	☐	☐

9. How often do you engage in the following activities when using online question-answering sites you indicated in Q8?
(Note: Q9 will be repeated for each choice made in Q8 when the questionnaire is administered online)

	Never	Less than once a month	A few times a month	Once a week	2-6 times a week	Once a day	2-4-times a day	More than 5 times a day
Post a question to the site	☐	☐	☐	☐	☐	☐	☐	☐
Answer a question asked by someone else	☐	☐	☐	☐	☐	☐	☐	☐
Rate someone else's answer	☐	☐	☐	☐	☐	☐	☐	☐
Comment on someone else's answer	☐	☐	☐	☐	☐	☐	☐	☐
Rate someone else's question	☐	☐	☐	☐	☐	☐	☐	☐
Search existing questions and answers	☐	☐	☐	☐	☐	☐	☐	☐
Browse existing questions and answers	☐	☐	☐	☐	☐	☐	☐	☐
Other, please specify ( )	☐	☐	☐	☐	☐	☐	☐	☐

Appendix E: Interview Protocol

Let's begin by talking about questions you asked and accompanying answers you received. Could you show me the first question you asked?

[Question Asking Using Yahoo! Answers]

1. [Task-related Attribute] What kind of information did you look for?

2. [Task-related Attributes] Why did you need this information?

    a. (Rating) On a scale of 1-7, to what extent was the question pressing?
    b. (Rating) On a scale of 1-7, to what extent was it important to have this question answered?
    c. (Rating) On a scale of 1-7, to what extent were you familiar with the subject matter of the question?

3. [Task-related Attributes] Did you conduct any other search before turning to Yahoo! Answers?
   [If answered YES] Could you tell me more about it?
    a. (Rating) [If answered YES] On a scale of 1-7, to what extent did you find it difficult to search for information to answer this question?

4. [Question Formulation Strategies] When you wrote this question, did you have specific ideas about how to write the question to increase the likelihood of getting high quality answers?
   Probe: Details, length, search similar questions, look at suggested questions, etc.

5. [Question Formulation Strategies] Did you know that you can share your question with your friends on social network sites once you post a question?
   [If answered YES] Did you use the feature to share this question with your friends?
   [If answered YES] Which social media (Tumblr, Twitter, Facebook, Google+) did you use? Why?
   [If answered NO] Could you tell me why?

[Check the number of answers received: No one answered this question or XX users answered this question.]

Now, I'd like to talk about answers you received.

First, let me ask you questions about each answer you received.

[Credibility assessment of each answer received with respect to the question]

6. [Answer credibility] To what extent do you find this answer high quality? What made you think so? What did you look at when you assessed the quality of this answer?
   Probe: Elements noticed and interpreted.
   (Rating) On a scale of 1-7, to what extent do you find this answer credible?

7. [Answerer credibility] What do you think about this user who answered your question? Why? What did you look at to get information about this answerer?
   Probe: Elements noticed and interpreted.
   (Rating) On a scale of 1-7, to what extent did you find this user credible?

[After going over all individual answers, ask questions about evaluation of aggregate answers and "best answer" if applicable.]

Now, I'd like to hear about how you pick the best answer.

8. [Multiple answers: Best answer] You selected this answer as the best. Could you tell me how you selected the best answer? [If Best Answer not selected] Why didn't you pick the best answer?

[Outcome of the information seeking task with respect to the question]

9. [Informational outcome] To what extent do you feel that you got what you looked for with respect to this question? Why?
   (Rating) On a scale of 1-7, to what extent do you think that you succeeded in getting what you looked for with respect to this question?

10. [Social outcome] Aside from the answers themselves, how would you describe your experience with interacting with other people on Yahoo! Answers? What made you think so?
    (Rating) On a scale of 1-7, to what extent were you satisfied with interacting with other people on Yahoo! Answers?

11. [Information Use] What did you do with information you obtained from these answers?
    Probe: Did you verify it? How? Did you ask your friends? Did you search the Web? Did you check a link provided in an answer? Did you share it with other people?

Now, I'd like to move onto the next question. Could you show me the next question you posted?

[After going over all 5 questions, ask questions about overall credibility assessment in Yahoo! Answers]

Now, I'd like to hear about your overall credibility assessment in Yahoo! Answers.

[Overall credibility assessment in Yahoo! Answers]

12. [Credibility: interaction-level] If someone asks you what specific things to which they should pay attention when she assesses credibility in Yahoo! Answers, how would you respond?

13. [Credibility: heuristics-level] If someone asks you if there are any general rules of thumb to assess credibility in Yahoo! Answers, how would you respond?

14. [Credibility: construct-level] How would you define credibility in the Yahoo! Answers setting?

15. [Credibility: construct-level] Do you feel that how you define credibility in Yahoo! Answers has changed over time?

[Overall Experience Using Yahoo! Answers]

Before we wrap things up, I'd like to hear about your overall experience using Yahoo! Answers.

16. [Experience with Yahoo! Answers] As a current user of Yahoo! Answers, what do you usually do on Yahoo! Answers?

17. [Perception of Yahoo! Answers] If someone asks you what Yahoo! Answers is, how would you explain Yahoo! Answers to that person?

18. [Perception of Yahoo! Answers] Based on your experience with Yahoo! Answers, do you think that you will continue to use Yahoo! Answers in the future?
    [If answered YES] With what kind of questions will you use Yahoo! Answers in the future? Why?
    [If answered NO] Why?

19. [Perception of Yahoo! Answers] Would you be willing to recommend Yahoo! Answers to your friends? Why?
    Probe: In terms of informational outcome, and social outcome?

20. Is there anything else you want to share with me about your experience with Yahoo! Answers?

I am now stopping audio-recording. Lastly, I'd like you to fill out an online post-interview questionnaire.

[Open a link to a Post-Interview Questionnaire]

That's all I have today. Thank you so much for your time. Do you have any questions or comments before we complete this session? Thank you.

Appendix F: Scale Sheet

Question # _____

How urgent was this question on a scale of 1-7?

1	2	3	4	5	6	7
Not at all urgent	Slightly urgent	Somewhat urgent	Moderately urgent	Quite a bit urgent	Very urgent	Extremely urgent
☐	☐	☐	☐	☐	☐	☐

How familiar were you with the topic of this question on a scale of 1-7?

1	2	3	4	5	6	7
Not at all familiar	Slightly familiar	Somewhat familiar	Moderately familiar	Quite a bit familiar	Very familiar	Extremely familiar
☐	☐	☐	☐	☐	☐	☐

How successful was your search experience from this question on a scale of 1-7?

1	2	3	4	5	6	7
Not at all successful	Slightly successful	Somewhat successful	Moderately successful	Quite a bit successful	Very successful	Extremely successful
☐	☐	☐	☐	☐	☐	☐

How satisfied were you with interacting with other people on Yahoo! Answers about this question on a scale of 1-7?

1	2	3	4	5	6	7
Not at all satisfied	Slightly satisfied	Somewhat satisfied	Moderately satisfied	Quite a bit satisfied	Very satisfied	Extremely satisfied
☐	☐	☐	☐	☐	☐	☐

Appendix G: Post-Interview Questionnaire

Please answer the following questions based on your overall experience using Yahoo! Answers for this study.

1. In general, to what extent do you consider each of the following aspects important when assessing credibility of **users who answer questions** on Yahoo! Answers?

	Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
User's nickname	☐	☐	☐	☐	☐	☐	☐	☐
User's image	☐	☐	☐	☐	☐	☐	☐	☐
User's level in Yahoo! Answers	☐	☐	☐	☐	☐	☐	☐	☐
User's points	☐	☐	☐	☐	☐	☐	☐	☐
Number of questions a user previously answered	☐	☐	☐	☐	☐	☐	☐	☐
Percentage of a user's answer being selected as the best answer	☐	☐	☐	☐	☐	☐	☐	☐
Presence of a Top Contributor badge	☐	☐	☐	☐	☐	☐	☐	☐
Number of questions a user previously asked	☐	☐	☐	☐	☐	☐	☐	☐
When a user joined Yahoo! Answers	☐	☐	☐	☐	☐	☐	☐	☐
Length of answer	☐	☐	☐	☐	☐	☐	☐	☐
Inclusion of original sources of content in answer	☐	☐	☐	☐	☐	☐	☐	☐
Number of original sources cited in answer	☐	☐	☐	☐	☐	☐	☐	☐
Inclusion of user's first-hand experience in answer	☐	☐	☐	☐	☐	☐	☐	☐
The way a user writes an answer (writing style)	☐	☐	☐	☐	☐	☐	☐	☐
Presence of errors such as typos, misspellings, and grammatical errors in an answer	☐	☐	☐	☐	☐	☐	☐	☐
Other, please specify ( )	☐	☐	☐	☐	☐	☐	☐	☐

2. In general, to what extent do you consider each of the following aspects important when assessing credibility of the **content of answers** provided on Yahoo! Answers?

	Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
User's nickname	☐	☐	☐	☐	☐	☐	☐	☐
User's image	☐	☐	☐	☐	☐	☐	☐	☐
User's level in Yahoo! Answers	☐	☐	☐	☐	☐	☐	☐	☐
User's points	☐	☐	☐	☐	☐	☐	☐	☐
Number of questions a user previously answered	☐	☐	☐	☐	☐	☐	☐	☐
Percentage of a user's answer being selected as the best answer	☐	☐	☐	☐	☐	☐	☐	☐
Presence of a Top Contributor badge	☐	☐	☐	☐	☐	☐	☐	☐
Number of questions a user previously asked	☐	☐	☐	☐	☐	☐	☐	☐
When a user joined Yahoo! Answers	☐	☐	☐	☐	☐	☐	☐	☐
Length of answer	☐	☐	☐	☐	☐	☐	☐	☐
Inclusion of original sources of content in answer	☐	☐	☐	☐	☐	☐	☐	☐
Number of original sources cited in answer	☐	☐	☐	☐	☐	☐	☐	☐
Inclusion of user's first-hand experience in answer	☐	☐	☐	☐	☐	☐	☐	☐
The way a user writes an answer (writing style)	☐	☐	☐	☐	☐	☐	☐	☐
Presence of errors such as typos, misspellings, and grammatical errors in an answer	☐	☐	☐	☐	☐	☐	☐	☐
Other, please specify ( )	☐	☐	☐	☐	☐	☐	☐	☐

3. In general, to what extent do you find **users who answer questions** on Yahoo! Answers credible?

Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
☐	☐	☐	☐	☐	☐	☐	☐

4. In general, to what extent do you find **the content of answers** provided on Yahoo! Answers credible?

Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
☐	☐	☐	☐	☐	☐	☐	☐

5. How often do you ask a question of other people in your social network to seek information using the following social media services?

	Never	Less than once a month	A few times a month	Once a week	2-6 times a week	Once a day	2-4-times a day	More than 5 times a day
Facebook	☐	☐	☐	☐	☐	☐	☐	☐
Twitter	☐	☐	☐	☐	☐	☐	☐	☐
Google+	☐	☐	☐	☐	☐	☐	☐	☐
Tumblr	☐	☐	☐	☐	☐	☐	☐	☐
Other, please specify ( )	☐	☐	☐	☐	☐	☐	☐	☐

6. In general, to what extent do you find **people who answer questions** on social media services you indicated in Q5 credible?
(Note: Q6 will be repeated for each choice made in Q5 when the questionnaire is administered online)

Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
☐	☐	☐	☐	☐	☐	☐	☐

7. In general, to what extent do you find **the content of answers** provided on social media services you indicated in Q5 credible?
(Note: Q7 will be repeated for each choice made in Q5 when the questionnaire is administered online)

Not at all	Slightly	Somewhat	Moderately	Quite a bit	Very much	Extremely	Don't know
☐	☐	☐	☐	☐	☐	☐	☐

8. In general, how do you seek information in each situation? Check all that apply.

	For school-related information	For work-related information	For personal-related information
Search the Web using an online search engine	☐	☐	☐
Search Wikipedia to find content on it	☐	☐	☐
Post a question to an online question-answering site like Yahoo! Answers	☐	☐	☐
Post a question to an online discussion forum	☐	☐	☐
Ask your friends a question in person	☐	☐	☐
Ask your friends a question via email	☐	☐	☐
Ask your friends a question via text message/SMS	☐	☐	☐
Ask your friends a question via a Facebook status message	☐	☐	☐
Ask your friends a question via a Twitter status message	☐	☐	☐
Ask your friends a question via instant message like Google Talk or Yahoo! Messenger	☐	☐	☐
Other, please specify ( )	☐	☐	☐

Appendix H: Codebook Used for the Analysis of Interview Data

Topic	Code	Subcode	Sample Quotes
Perception of social Q&A service	Characteristics	Crowd-Based	Yahoo! Answers is a site that a large group of people can use to ask questions or to answer them. (S43)
		Heterogeneity	I think anyone could ask any question they want and you could have people answer. (S41)
		Openness	I think it's more like a forum type question because everyone can see each other's answers and there's that visibility aspect to it. (S78)
	Benefit	Saving time and effort	If you had an opportunity over millions of users and get some answers, rather than take 20 minutes and look online, I think it's a very time efficient way. (S44)
		Connection	So it's a way of tapping into kind of the human capital resource of anyone in the world. (S57)
		Diversity	It's just like an online community where you can ask questions and get a variety of answers from different people from different perspectives. (S54)
	Cost	Uncertainty	So it's not a place to necessarily get all your questions answered, but it's a source where you can ask questions and sometimes someone will help you out. (S65)
		Randomness	You either really get what you want or you don't even get any answers or you get jokes with answers. (S24)
		Difficulty	It's not always possible to discern the credibility. (S21)
Use of social Q&A service	Collection		And it also has a database of other questions that have been asked. So it can be an easy reference if you have maybe a common question that someone else might have had [asked]. (S06)
	Secondary source		I will post a question if I can't find good information elsewhere. (S67)
	Search for fun		I'll just look up sometimes I guess outrageous questions or things that interest me, just browsing on Yahoo! Answers. (S28)
Goal of social search	Curiosity		I was just curious about what people thought the results would be this year. (S02)
	Decision making		I am about to pick my fall schedule for this year, so I just wanted to know if anyone knew any good classes to take here. (S62)
	School-work help		I was looking for a way to mix up the words I was using in my paper. (S42)
	Gaining knowledge		I really wanted to learn new tricks and ideas to improving my memory. (S37)
	Problem solving		My bamboo plant was dying so I wanted to see what to do. (S32)
Expectations for answers	Number of answers		I think basically it will have a higher possibility that more people can answer this question because it's about New York City or a lot of

Topic	Code	Subcode	Sample Quotes
			tourists also can tell me about it. (S10)
	Characteristic of answer	Experience	I feel like someone must have done something like this before. (S05)
		Expertise	Maybe I could get some more insight and maybe some doctor answers or something. (S17)
	Quality of answer	Specificity	I would think that someone will either give me a step-by-step answer of how to do it, because I don't think it'll be that hard. (S57)
		Diversity	I think I was more interested in what the wide range of all the answers were going to be. (S33)
		Novelty	I kind of hoped that I'd hear something that I hadn't already heard before. (S60)
		Comprehensiveness	I guess just expecting someone to kind of in layman's terms describe exactly what it is. (S56)
Question-formulation strategy	Narrow down	Main characteristic	I wanted to specify "I want a cheaper alternative." (S08)
		Focus	I guess to narrow it is why I added this context of life expectancy, because that's what I was focusing on this term. (S29)
		Information type	I put in the extra description "just looking for opinions" just so people would know kind of what I was looking for. (S53)
		Not option	I did say about my past research that some people suggested that I use milk to make cheese or yogurt, and I did say that I don't want to do that because it's time consuming. (S26)
	Contextualize	Demographic information	I thought maybe including my status as a college student, my age, it might give a rough idea of, "Oh, yeah, I notice that typically college students wear this type of watch" or as versus to a business man or a blue collar worker or anything like that. (S06)
		Taste	I gave them examples of what I usually drink so that will kind of give them an idea of what I like. (S05)
		Familiarity	I told people what I had read so they don't repeat and just, "Oh, read this," but I have already read it. (S49)
		Details	I guess I wanted to treat it like a doctor's appointment where they wanted to know why it was happening or how severe the pain was and stuff like that. (S28)
		Reason	I wanted to write for a "date night" specifically because that gets a bit different response than just for a group or for other things. (S67)
	Target	Jargon	I specifically put "Nasty Gal" because people who know Nasty Gal know the type of clothing. (S41)
		Idea in title	I didn't actually ask a question in the beginning. I kind of gave the topic. (S05)
	Lower	Open question	I guess make it more open or make it seem more light-hearted rather than like a serious question. (S01)
		Simple words	I just wanted to keep the terms simple and make

Topic	Code	Subcode	Sample Quotes
			sure the audience got what I was saying. (S22)
	Attract	Brief question	I feel when you type out a long paragraph, the more you type and the longer it is, the more likely someone is to get lost along the way. (S13)
		Structure	I tried to break up the question of finiteness into a few categories so that way—because they might have different answers. (S79)
Outcome of social search	Informational outcome	Multiple answer	Well, I could choose between a lot of different answers, which was nice. (S35)
		Comprehensive answer	Because he used language that wasn't too complicated, it wasn't beyond me. (S22)
		Various opinions	I got multiple suggestions and brands so if one of them doesn't work, the other one probably would. (S67)
		New perspective	I got an unconventional answer that I hadn't really thought of. (S75)
		Future reference	Because now I have the potential to use that website that I was given. (S48)
		Extra information	They also gave a few more information since they gave me suggestions that milk does not actually spoil until a week after. (S26)
		Direction	He sort of triggered me to ask additional questions and narrow down my question. (S36)
		Confirmation	I got an answer that supported my already existing beliefs. (S29)
		Effective answer	Because she actually gave a list and when I go on Friday, I actually plan on going there. (S41)
	Social outcome	Good vibe	Some of them were really nice like the badminton one and they were like, "Hi, Anna," and they actually said my name. (S01)
		Effort	I got an extensive answer where he recommended a book and wrote about what he learned from the book, it looks like he took time to write this, and he gave a bunch of tips, and I appreciated the length. (S20)
		Attempt	I'm "Somewhat satisfied" because of their attempt to help me and even though I didn't walk away with so much that was beneficial. (S38)
		Needs understood	He really understood where I was coming from on this question because I think my question I intended more nuanced than maybe I actually portrayed in my question. (S72)
		Enjoyment	I actually had quite a fun time reading these. (S09)
		Responsiveness	I received responses right away, the first few minutes I posted it, I got responses so it was good. (S08)
		Endorsement	The fact that he did get a thumbs up for the gluten intolerance post does have some value. (S25)
		Limitations	I don't really feel like on Yahoo! Answers you kind of ask a question and you get something back; there's not a whole lot of interaction. (S11)
Credibility	Constructs	Pertinence	Aspects of credibility would be relevancy and

Topic	Code	Subcode	Sample Quotes
assessment			how relevant they are to the question and not random things I don't care about like I see on some of the posts. (S34)
		Expertise	I think that giving a very detailed answer and showing that you know a lot about the subject, that's where you find credibility. (S51)
		Sincerity	I guess I was judging credibility in terms of how genuine the people were, if that makes sense, and that they actually wanted to answer the question versus were telling me about something else. (S32)
		Validity	In this setting, since you don't know who the other person is, sources and where they found their information from is important. (S20)
	Characteristics	Relative	I would say that credibility has a lot to do with comparisons on Yahoo! Answers because you get a certain set of answers and then you read them all, but you're comparing one answer [with] the other. (S05)
		Crowd-Assisted	I also think that to go checking their profile also reaffirms their credibility because I could see how people rated them. (S44), So one of the things that makes answers credible is if other people are saying very similar things. (S37)
		Transient	I think the credibility of Yahoo! Answers depends a lot on what type of question you're asking and also who is answering the question. (S08)
	Criteria	Applicability	I actually tried one of these methods and it actually did work. (S36)
		Novelty	Those both had some other neighborhoods that I hadn't heard about. (S02)
		Diversity	It gave me a lot of options to check out to choose which option would be the best. (S38)
		Experience	Because he is talking about fewer graduates will be employed for shorter periods. So it's more feeling he really knows the job market. So more from personal experience perspective. (S40)
		Thoroughness	They explained every single term of what I asked, they explained what alpha level is, what beta level is, and then what power is and then tied everything together. (S76)
		Well-Written	I'm just assuming that he did and just the way that he worded his answer, he says, "New climbers try to put 'em up," like he's probably—I just assume that he was experienced. (S39)
		Reputability	I saw the "top contributor" label under the name, so I thought that it was a pretty reliable source. (S31)
		Seriousness	I think it is 'cuz I think he answered my question pretty seriously, so I think it's reliable. (S71)
		Niceness	His tone was very respectful and it wasn't at all pushing his views on me. (S77)
		Effort	So it just looked like this guy put a lot of time

Topic	Code	Subcode	Sample Quotes
			into actually going out and finding the information for me and then copying and pasting it into here. (S07)
		Spam-free	When people give me a website, it gives me an idea that people are trying to promote their service or their business. (S26)
		Source	I mean he posted the .edu source so I thought obviously he did some research and this is based off of that. (S17)
		Congruence	It seems to confirm with the other information that seemed reliable, so I think that would be the best one. (S21)

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