

Social Search Behavior in a Social Q&A Service: Goals, Strategies, and Outcomes

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ABSTRACT

Recent advancements in social technologies allow information seekers to reach out to a larger, more distributed group of people online when searching for information. In this study, people's question-asking behavior using a social Q&A service is conceptualized as social search behavior. We are particularly interested in investigating social search goals, strategies, tactics, informational outcomes, and social outcomes. We collected a total of 406 questions posted on Yahoo! Answers by 78 participants over one week. Interviews based on those questions and answers they received were conducted and content-analyzed. We identify five distinct search strategies and 15 tactics positioned on a continuum of two different dimensions in terms of answer quantity and answer quality. Pursuit of quantity or quality is influenced by five categories of goals identified in this study. The goals and associated strategies and tactics also influence people's perceived informational outcomes and social outcomes. Contributions of this study to the social search research community and implications for practitioners in the area of social Q&A services are discussed.

Keywords

Social search, social Q&A, information seeking, question formulation, social media.

INTRODUCTION

Social search includes a range of information-seeking activities such as asking questions of others using online services (Morris, Teevan, & Panovich, 2010a, 2010b), looking for information using search engines that utilize social feedback or data mining of social media streams (Morris et al., 2010a), or searching socially generated content such as tweets (Evans & Chi, 2010). In this paper,

we 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" (Jeon, 2014, p. 2).

People rely on interactions with others during the process of information seeking. Recent advancements in social technologies have changed the extent, speed, and convenience of such interactions in ways that allow seekers to reach a more distributed and larger group of people online quickly and easily. In this paper, we are interested in understanding and characterizing online social search in which a person interacts with a large number of *unknown people* using a social question-answering (Q&A) service.

For our purposes, social Q&A services refer to 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. People can also comment on questions or answers and evaluate the quality of answers through ratings or votes. Previous research on social Q&A tends to characterize a social Q&A service as an online community producing user-generated content. Thus, the majority of previous work has focused on the motivations and behavior of contributors who provide answers (Nam, Ackerman, & Adamic, 2009; Oh, 2012). As a result, there are few empirical studies on social Q&A services from the information seeker's perspective.

In this study, we focus on search behavior of people who post questions to a social Q&A service with expectations of receiving answers from "unknown people" online. The information seeking is social in that these services afford engagement in one-to-many interactions within a single Q&A session through various activities including answering, commenting, rating, and voting. While some levels of iterative interactions can take place in the social Q&A settings, user interfaces of social Q&A services provide limited support for iterative interactions among users. As a result, the interaction between the asker (i.e., poster of a question) and others involved in the session (i.e., providers of answers, comments, ratings, and votes) is likely to take the form of a one-time interaction, unlike in

other kinds of search systems such as web search engines, in which people can easily reformulate their queries.

The lack of iterative process in this particular search setting poses unique challenges to information seekers: they must employ the best possible search strategies in order to find what they want. While they may interact with a large number of individuals, it is almost impossible to track back to the person who provided the best answer and re-ask the question. In addition, the asker's posting is becoming public information in most social Q&A services, which could make it difficult to go back and modify questions. In other words, while the nature of social search offers a number of advantages and values as a search system (e.g., Jeon & Rieh, 2013), information seekers may not feel that they have much control in interactions among users with different roles (e.g., askers, answerers, and commenters). Further, due to such social aspects in the process of seeking, people may feel that there is no guarantee that rich interactions will yield successful and satisfactory search outcomes. As a result, deciding on search strategies based on expectations of best outcomes is an important problem to investigate. This unique challenge that users experience when using a social Q&A service as a search venue has become the primary motivation of our research.

This study contributes to the field of information science by investigating the characteristics of social search behavior in the context of a social Q&A service. While there have been numerous studies about users' search goals, strategies, and outcomes in various interactive information retrieval systems, we know little about such characteristics in the context of social search. People recognize particular values of social search and sometimes prefer social search to web search when they seek tailored information, expect to access original and non-popular information, and desire to interact with real people (Jeon & Rieh, 2013). Given such values of social search, we expect that it might involve distinct sets of goals, strategies, and outcomes. Findings may have implications for designers of social Q&A services.

RELATED WORK

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 behavioral perspective or a system-based perspective.

Evans and Chi (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) provide 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 social network sites (SNSs); examples of social feedback systems include search engines and recommender systems that utilize social information (Chi, 2009). Burghardt, Heckner, and Wolff (2012) used the term "social search" to refer to any information retrieval system that utilizes the user's social context to improve the search process, viewing social search systems as a type of social software that supports communication and collaboration.

As social search includes a wide range of information activities, it is difficult to reach consensus about a single precise definition. 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.

Information Seeking in Social Q&A Contexts

Social Q&A services are community-based services that allow people to ask questions and receive answers from fellow users on a broad range of topics. Most previous work on such sites has been conducted at the aggregate level, analyzing large sets of activity data to identify common patterns (Adamic, Zhang, Bakshy, & Ackerman, 2008; Nam et al., 2009; Shah, Oh, & Oh, 2008). Past studies show little overlap between those who ask questions 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; Shat et al., 2008).

Many studies have examined the kinds of questions people ask on social Q&A services through content analysis. As people are allowed to ask questions on a broad range of topics, there is a huge range of question types, with the prevalence of these types differing by category (Nam et al., 2009). Questions can be broadly classified as either conversational or informational (Harper, Moy, & Konstan, 2009). While most studies have looked at questions across all categories available, a few have explored typologies in a specific category (e.g., health), and developed a category-specific or disease-specific typology (Bowler, Oh, He, Mattern, & Jeng, 2012; Oh, Zhang, & Park, 2012).

In addition, some work has investigated linguistic aspects of questions such as rhetorical strategies (Harper et al.,

2009) or linguistic properties (Oh, He, Jeng, Mattern, & Bowler, 2013) to understand how people express information needs and how this influences answer quantity and/or quality. A few studies have suggested ways to help people ask better questions by generating typologies of failed questions (i.e., ones that received no answers) (Shah, Radford, Connaway, Choi, & Kitzie, 2012), or by investigating the role of social Q&A sites as social learning communities (Ahn, Butler, Weng, & Webster, 2013).

Responsiveness and diversity of answers resulting from interacting with a large community appear to be two main reasons that people use social Q&A sites (Harper, Raban, Rafaeli, & Konstan, 2008; Radford, Connaway, & Shah, 2012; Shah et al., 2008). Furthermore, it seems that people use social Q&A services as complementary means of searching for information in the process of information seeking, turning to them to obtain an answer to a question that could not be found quickly via a search engine (Kim, 2010; Kitzie, Choi, & Shah, 2012). The fact that people can receive personalized answers has also been found to be one of benefits of social Q&A services (Jeon & Rieh, 2013; Shah et al., 2008).

While prior work has examined why people turn to social Q&A sites for their information needs, and what questions those who seek information post on social Q&A sites, attention has mostly focused on understanding those who answer questions, due to the fact that social Q&A services have been examined primarily as online communities that produce user-generated content. Little work has examined strategies people employ when they post questions. Examining social Q&A services under the framework of social search will help us understand how information-seeking practices are shaped by interactions with a crowd of unknown people. Furthermore, our work seeks to fill this gap by qualitatively investigating how askers formulate questions in a social Q&A setting where they seek help from a large number of people they do not know.

We seek to investigate social search behavior in a social Q&A setting, focusing on three aspects: search goals, search strategies, and search outcomes. Specifically, this study addresses the following three research questions:

- Research Question 1: What do information seekers intend to achieve by using a social Q&A service for social search?
- Research Question 2: What kinds of question formulation strategies and tactics do information seekers employ to achieve their social search goals?
- Research Question 3: How do information seekers' goals and question formulation strategies influence perceived outcomes of social search?

METHODS

To address this study's research questions, it was critical to collect data that was drawn from individuals' first-hand experiences in the context of their daily lives. Thus, we

decided to design a study in which participants were asked to use a social Q&A service for one week by posting their own questions to the social Q&A site in natural settings. Then, semi-structured interviews were conducted based on real questions posted by participants and answers they received. This research design allowed us to collect nuanced and in-depth data about participants' social search behavior in a social Q&A setting.

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 a popular social Q&A service and also the largest, with approximately 5 million unique monthly visitors (US) as of May, 2015 (Quantcast, 2015). On Yahoo! Answers, users can engage in various information activities: (1) question asking and answering, (2) question/answer searching, and (3) question/answer evaluating. To motivate and reward users, Yahoo! Answers has a system of points and levels (i.e., from Level 1 to Level 7). Users move up to higher levels as they earn points by participating in these various activities.

Research Design

This study involved three steps: (1) an introductory meeting; (2) one week's use of Yahoo! Answers; and (3) a post-use interview. The introductory meetings were conducted prior to participants' one week's use of Yahoo! Answers. In this meeting, they were provided with an overview of the study. Administration of an informed consent form and an online background questionnaire followed. Data including basic personal information as well as information about the participants' past experience with Yahoo! Answers and other online Q&A services was collected through the background questionnaires.

Participants then were asked to use Yahoo! Answers for one week. During this period, they were asked to post at least five questions to Yahoo! Answers. As this study aimed to ensure that participants used Yahoo! Answers in as realistic a manner as possible, they were instructed to post questions on any topic that interested them. They were also instructed to follow the question they posted, read all answers they received, and choose the best answer if applicable.

At the conclusion of one week, semi-structured in-person interviews were conducted. During the interviews, participants were asked the following questions: (1) what they had been looking for; (2) how they formulated their questions; (3) how they made credibility judgments; and (4) how they perceived the outcome of the information-seeking task with respect to each search episode. For each search episode, participants were also asked to rate the following dimensions on a scale of 1 – 7 (1 = not at all, 7 = extremely): (1) urgency of the question; (2) familiarity with the subject of the question; (3) their perceived success; and (4) their perceived satisfaction. Interviews lasted an average

of 40 minutes, ranging from 24 to 77 minutes. Following the interview, an online post-interview questionnaire was administered. Monetary compensation was provided for taking part.

Participants

We recruited 78 undergraduate students from a research university in the Midwest through an invitation sent via email and flyers posted around the campus. Those who had a Yahoo! Answers account and had posted at least one question on Yahoo! Answers over the last three months at the time of recruitment were eligible to participate. 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 (mean age = 20). More than half ($n=47$; 60%) had previously used at least one online Q&A service other than Yahoo! Answers; 31 participants (40%) had no experience with other services.

Questions Collected

A total of 406 questions were posted by participants, with 364 (90%) receiving at least one answer. Questions received 2.74 answers on average. Participants asked questions on a wide range of topics, covering 24 out of the 26 topical categories available on Yahoo! Answers.

Data Analysis

All of the 78 interviews were audio-recorded and transcribed. The interview transcriptions were imported into NVivo for qualitative analysis. A codebook was developed by the first author, both deductively from the interview questions and inductively as themes emerged from the data. The codebook includes 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. In this paper, we report on findings related to *goal of social search*, *question-formulation strategy*, and *outcome of social search* only. The topic of goal of social search included five codes (i.e., curiosity, decision making, school-work help, gaining knowledge, and problem solving). The topic of question-formulation strategy was analyzed using five codes (i.e., narrow down, contextualize, target, lower, and attract) and 15 subcodes. The data from background questionnaires and post-interview questionnaires were imported into Stata for quantitative analysis.

RESULTS

Social search goals

Before discussing search strategies, we begin with goals because we believe that search goals lead people to choose particular search strategies (Xie, 2000). In this study, a “goal” was defined as what the asker intended to accomplish with answers to the question he or she posted

on Yahoo! Answers. During the interview, participants were asked what they were looking for and why they needed that information for each search episode associated with their question. Analysis of participants’ responses to these two questions reveals a set of social search goals.

What we first noticed was that the most popular search goal mentioned was to satisfy curiosity ($n=125$; 31%). Participants said they were just interested in knowing something, which was often triggered unexpectedly by a range of daily activities such as classes, conversations with friends or family members, or consumption of TV shows or news articles. Some reported that curiosity was triggered by long-held interests. Not surprisingly, these participants reported the lowest sense of urgency ($M=1.64$) and lowest level of familiarity ($M=3.56$) compared to other goals on a scale of 1 – 7 (1 = not at all, 7 = extremely) in getting answers.

Other goals tended to be driven by specific tasks such as making a decision, receiving help with school-related work, gaining knowledge or skill for personal development, and solving a problem. 77 participants (19%) decided to post questions to gather people’s opinions to help them decide what to do in a wide range of situations. 72 participants (18%) used Yahoo! Answers specifically for the purpose of getting help with school-related tasks including homework, test preparation, research assignments, and extracurricular activities. This is a somewhat distinct category, showing the highest level of urgency by askers ($M=4.08$). Another identified goal was related to participants’ interests in personal development in the areas of learning or improving new skills, gaining knowledge for future career development, health management, and time management, among others. The goal of problem solving was mostly situated in everyday contexts, with participants often mentioning issues such as beauty, housekeeping, or computers.

While there was no significant difference in participants’ familiarity with the subject of the question depending on goal type, $F(4, 401) = .61, p > .05$, urgency was found to be significantly different according to goal type, $F(4, 401) = 40.07, p = .000$. Table 1 presents examples for each goal category, along with frequencies, urgency, and familiarity.

Question-formulation strategies for social search

Adopting 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.

The results reveal that when formulating questions, participants employed different strategies and tactics by determining their position on a continuum of two dimensions of answer quantity and answer quality. The position on this continuum appeared to be influenced by their social search goal.

Types of Goals	n=406	Urgency M (SD)	Familiarity M (SD)	Example Questions
To satisfy curiosity	125 (31%)	1.64 (1.00)	3.56 (1.68)	Why is this winter so cold? Are Manchester United and Real Madrid coming to Michigan this year?
To make a decision	77 (19%)	3.12 (1.51)	3.77 (1.61)	Being president of your fraternity...? What is a good entry level road bike under \$300?
To receive help with school-related work	72 (18%)	4.08 (1.81)	3.92 (1.65)	Can someone explain alpha decay vs. beta decay? What is an interesting stock to write a report on for class?
To gain knowledge or skill for personal development	71 (17%)	2.49 (1.53)	3.72 (1.76)	How can I expand my vocal range? What careers does a sociology degree prepare you for?
To solve a problem	61 (15%)	3.77 (1.84)	3.56 (2.04)	No Internet Access for a Weekend? What should I do to get rid of bruises quick?

Note. Ratings were based on a scale ranging from 1 (not at all) to 7 (extremely).

Table 1. Goals of Social Search Using Yahoo! Answers

Participants reported that they put more emphasis on answer quantity, getting a large number of answers from many users, when their goal was to receive help with school-related work. In contrast, when they posted questions to gain knowledge or skills for personal development or to solve problems, they stated that getting high-quality answers was more important than getting a large number. Participants who asked questions to seek information that would help them make a decision were located in the middle of this continuum, placing equal emphasis on getting more answers and getting better ones. Those who posted questions out of curiosity mostly showed a pattern of using strategies that were less clear because they tended to post their questions spontaneously.

Table 2 summarizes five question-formulation strategies and 15 tactics associated with the strategies that were identified in this study. A detailed description of each strategy and associated tactics follows.

Answer-quantity oriented strategies

When participants were under time pressure and they had very specific tasks to accomplish, such as getting help for their school-related work, their expectation was clear: it was more important for them to increase the chances of getting answers or increase the number of answers they would receive. With such expectations, they developed two distinct strategies: (1) attract the attention of potential answerers, and (2) lower barriers to answering.

Attract the attention of potential answerers

Participants tried to attract the attention of potential answerers to increase both the chance of getting answers and the number of answers they would receive. They were aware that many questions were remained to be unanswered. Therefore, their strategy was to get their question to be noticed in the first place by making those questions visible.

The participants who aimed at increasing the quantity of answers stated that questions should be brief and straightforward because if they wrote long questions, “no

one would bother to read it” as S02 stated. In a similar vein, S53 reported, “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.”

Participants also reported paying attention to the structure of their questions to make them 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. S61 stated that “the question is just kind of an eye grabber, but the real question is in the details.” Moreover, a few participants organized their questions using several sub-questions within one question to enhance readability. For example, S39, who wanted tips for expanding his vocal range, stated, “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?”

Lower barriers for potential answerers

Another answer-quantity oriented strategy was to lower barriers for potential answerers. Having a question get recognized did not guarantee that those who read it would answer it. Participants reported a belief that questions with more room for interpretation and that were easier to understand would attract more answers by lowering barriers for answerers, making them more willing to respond.

To lower barriers for potential answerers, some participants left questions open, including few or no restrictions, hoping potential answerers would feel more inclined to answer. Participants indicated that if readers considered certain questions to be too specific, they might perceive them to be challenging and choose not to answer. Therefore, askers wanted to signal that their questions would not require much effort to answer by making them broad. This result complements prior findings that people tend to answer questions that are easy to answer quickly (Nam et al., 2009).

	Strategy	Tactic
Answer-Quantity Oriented	Attract the attention of potential answerers	Make a question brief Structure a question in a reader-friendly style
	Lower barriers for potential answerers	Leave a question open Use simple words in a question
Answer-Quality Oriented	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
	Narrow down options	Provide main characteristics/ 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
	Target a specific audience	Use jargon in a question Put a title with main ideas in a question section

Table 2. Question-Formulation Strategies and Tactics

Enhancing understandability of questions by using simple vocabulary was another tactic employed to lower barriers. Participants suggested that if people better understood what was being asked, they would be more willing to answer. For example, S69 made sure people understood what “NCLB” meant by spelling it out as “No Child Left Behind.” S36 noted that he refrained from using the word “dexterity” in his question about workout methods to gain dexterity (i.e., to increase his grace and agility of motion) 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?”

Answer-quality oriented strategies

When participants posted questions with the goals of gaining knowledge or skills for personal development or solving problems, they preferred answers of high quality. They often emphasized the characteristics of answers in terms of specificity, comprehensibility, diversity, and novelty. Specificity and comprehensibility were associated with answers that were carefully tailored to their problems. Diversity and novelty were related to the general nature of social search in which a large number of people could post answers. To increase the likelihood of receiving high-quality answers, participants mentioned strategies categorized as follows: (1) contextualize a question, (2) narrow down options, and (3) target a specific audience.

Contextualize a question

When seeking high-quality answers, participants wanted to be more explicit in their questions. One strategy was to provide background information about not only themselves but also their situation. They predicted that 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, “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.”

Personal taste was another detail participants considered useful to help answerers understand who they were. This tactic was used more often when participants expected suggestions. 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.” S49 stated, “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 of 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, “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.”

Some participants reported the belief that including a detailed description of the problem would help them receive answers specific to their situation. For example, S26, who looked for recipes that require milk, noted, “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. . . 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 was to explain why participants were asking it. This was mainly intended to avoid misinterpretation of what participants were looking for, and thus ensure quality answers that would be pertinent. S02, who posted a question about stock, stated that he wanted to explain that “it was for a class so I wasn’t asking for advice on buying stock.”

Narrow down options

To ensure quality answers, participants used the strategy of narrowing down options by adding conditions to their questions. They seemed to believe that by doing so they could help potential answerers better identify what they wanted. Four tactics were identified in this study to implement this strategy: providing main characteristics, explaining the focus, indicating the type of information, and describing what is not an option.

Participants specified their needs by including main characteristics or aspects of what they were looking for in their questions. For example, some participants who asked purchase-related questions mentioned what factors they would consider by specifying price range or occasion. S09, who put ‘how they differ’ in her question about the Czech and Slavic languages, clearly indicated specific aspects of the issue she was interested in.

Some narrowed down options by specifying what sub-topic they were interested in within the topic of the question. S54, who wanted to see what others thought about the starting pitchers for the Braves, explained, “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. Type of information can be understood in terms of source (e.g., online and offline) and nature of information (e.g., opinion, fact, and recommendation). S24 said he chose to use the word “website” instead of saying, “What is a good internship in Chicago?” because he wanted “something online instead of something in person.” S53 stated, “I put in the extra description ‘just looking for opinions’ just so people would know kind of what I was looking for.”

Some participants included information about not only what they were looking for but also what they were not looking for. By describing what was not an option for them, participants hoped to avoid receiving information that was not pertinent. S12 explained the reason why he included a

certain phrase at the end of his question: “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.”

Target a specific audience

In addition to filtering out potential answers by narrowing down options and contextualizing their questions, participants said they intended to reach out to those who would be more qualified to answer their questions by targeting a specific audience. For instance, a few participants intentionally used jargon to target people who were knowledgeable about their subject. 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.’” A few other participants utilized a feature of the system. When posting a question, askers were given two sections, a mandatory section for a question with a 140-character limit and an optional section for additional details with a 1500-character limit. Some participants included main ideas in the question section to appeal to people who would be knowledgeable about the subject. 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, “I feel like I would get more people who would have information about that specific topic.”

Social search outcomes

Social search using Yahoo! Answers involves interactions not only with information but also with real people. In order to capture these two different dimensions of perceived search outcomes, informational outcomes and social outcomes were measured separately for each search episode. The informational outcome was operationalized as participants’ ratings of success in finding information using Yahoo! Answers, and the social outcome was operationalized as participants’ ratings of satisfaction with interactions with other people in the process. Ratings of success in the 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 posted). See Table 3 for details.

When asked to rate their perceived success and perceived satisfaction for each search episode on a scale of 1 – 7 (1 = not at all, 7 = extremely), participants reported that they found their searches moderately successful ($M=4.26$, $SD=1.93$) and considered their interactions moderately satisfactory ($M=4.26$, $SD=1.92$). This tendency to be near the middle value of four 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

Social Search Goal	Avg. No. of Answers	Informational Outcome $M (SD)$	Social Outcome $M (SD)$
To satisfy curiosity (n=118)	3.49	4.17 (1.89)	4.26 (1.79)
To make a decision (n=71)	3.36	4.34 (1.76)	3.99 (1.92)
To receive help with school-related work (n=60)	1.63	4.80 (1.77)	4.72 (1.83)
To gain knowledge or skill for personal development (n=62)	2.42	3.97 (2.17)	4.11 (2.10)
To solve a problem (n=53)	2.11	4.08 (2.04)	4.30 (2.06)
Total (n=364)	2.74	4.26 (1.93)	4.26 (1.92)

Note. Ratings were based on a scale ranging from 1 (not at all) to 7 (extremely).

Table 3. Social Search Outcomes by Goal

outcomes. People may obtain a variety of informational outcomes as well as social outcomes, and they may find it difficult to distinguish between informational and social outcomes when assessing their search experience. For example, although people might have found some particular aspects of their search unsuccessful or unsatisfactory, they could consider their overall search successful or satisfactory to some extent if other aspects resulted in positive informational or social outcomes. Therefore, these negative and positive results seemed to offset each other, resulting in convergence to the middle value of four.

Comparisons across the different types of social search goals show no statistically significant difference in terms of informational or social outcomes, $F(4, 359) = 1.76, p >.05$, and $F(4, 359) = 1.31, p >.05$ respectively. However, comparisons between average informational outcome and social outcome for each goal type showed a pattern. Participants whose goal was to make a decision or to receive help with school-related work reported more positive informational outcomes, whereas those who held one of the remaining three types of goals reported more positive social outcomes. It is interesting to note that those who posted questions to receive help with school-related work obtained the fewest answers on average (1.63), but reported higher levels of satisfaction with informational outcomes. In contrast, participants who focused on high-quality answers reported higher levels of satisfaction with social outcomes. They may have been more likely to prioritize personalized answers, as they considered quality more important than quantity. Thus, they may have been more appreciative of others' attempts to answer their questions, which may have resulted in higher levels of satisfaction with the social outcomes. 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 fun. This may also have led to higher levels of satisfaction with social outcomes.

DISCUSSION

The findings from this study with respect to our first research question demonstrate that participants used a social Q&A service with the goal of searching for fun to satisfy curiosity in 31% of total search episodes. This suggests more attention needs to be paid to non information-oriented information-seeking episodes in the evaluation of social search. Our finding is consistent with the results from a Pew Internet report (Fallows, 2006) that reported that 30% of Internet users go online on any given day for no reason other than for fun or to pass the time. Some researchers also have paid attention to affective aspects of information seeking, particularly positive ones, with the goal of understanding information behavior from a holistic perspective (Brown & Barkhuus, 2007; Fulton, 2009; Kari & Hartel, 2007). However, the majority of previous work on pleasure-oriented information seeking has occurred in the context of leisure such as hobbies (Fulton, 2009; Hartel, 2010). Little work has specifically examined

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). Therefore, our finding that 31% of search episodes were initiated out of curiosity or interest reiterates the significance of including such perspectives when evaluating search experiences and success, as some researchers have pointed out (e.g., Elswiler, Wilson, & Harvey, 2012).

Regarding the second research question, we were able to identify a set of strategies and tactics that participants used to formulate questions, given the unique search interface of a social Q&A service which limited their ability to interact with other people. While a few studies have examined the effect of an asker's attitude, such as indications of effort or gratitude when posting questions, on the quantity and/or quality of answers received (Gazan, 2007; Harper et al., 2008), little work has investigated how askers formulate their questions. We found that depending on their goals, participants used different question-formulation strategies. This is not a matter of dichotomy, but of degree. When they aimed to gain knowledge or skill for personal development or to solve a problem, they tended to pursue the quality of answers by making questions specific. In contrast, they tended to broaden their questions to get more answers when they wanted help with school-related work. Those posting questions to make decisions seemed to use a mixed strategy in the hope of receiving both more and better answers.

The third research question addressed the outcomes of searches. It was somewhat surprising that participants' responses regarding informational and social outcomes converged toward the middle value of 4 ($M=4.26$) on a scale of 1 (not at all) to 7 (extremely). Perceived informational and social outcomes were not related to the average number of answers received. For instance, although the participants whose goal was to get help for school received the fewest answers, they perceived their search sessions to be the most successful (informational outcomes) and their social interaction the most satisfactory (social outcomes). However, participants who searched to satisfy curiosity did not set a lower bar for their expectations in terms of outcomes. Although those who searched to satisfy curiosity received the most answers on average, their ratings for informational and social outcomes were not higher than those associated with other kinds of goals.

Limitations

This study has several limitations. The use of undergraduate participants may have resulted in sampling bias. Although we were able to recruit current users of Yahoo! Answers, participants might have not been representative of Yahoo! Answers users. Artificiality was introduced as participants were instructed to post five questions during a period of one week. Although they were encouraged to post questions on any topic that interested them and at their convenience, they might have been selective in order to present themselves in a socially desirable light. Selection of one social Q&A

service as a study venue may limit generalizability. Despite these limitations, the findings from this study have produced several implications for designing social Q&A services, as described in the following section.

Design Implications

Findings from this study demonstrate that people employ different strategies depending on the weight they place on quantity or quality of answers when formulating questions. This is because social Q&A services provide limited support for iterative interactions, and thus question posters may have only one chance to represent their information needs. By better supporting question formulation, such services could help people achieve their search goals and enhance their overall experience.

First, social Q&A services could provide features that allow users to better articulate their needs, circumstances, and expectations when posting questions. Typically, such services offer ways to categorize questions in terms of topics to route them to those who are likely to answer them. For example, Yahoo! Answers allows askers to select one topic category for each question. Social Q&A services could offer more systematic and salient ways to indicate information to give answerers a better sense of askers and their questions. One way would be to add a step after categorization of the question that enables users to indicate types of answers they desire. A list of five different types of search goals identified in this study could be presented.

Social Q&A services could also help users learn how to ask better questions by providing feedback on question formulation. Social Q&A services tend to provide a very limited form of feedback to users by suggesting similar questions when they type in the question. Additional feedback after the question is posted could help users learn more about how to ask better questions. For example, a feature that allows askers to know how many people viewed their questions could be provided. This data would allow users to see how many people read their question compared to how many answered it. Such data could allow people to assess how effective their strategy was in attracting potential answerers, as well as in leading them to answer. Based on this assessment, people would be able to improve their question-formulation strategies by effectively adjusting the weight on either the quantity or the quality of answers. In addition, given the findings of this study that users tend to employ different search strategies depending on search goals, askers could gain a better sense of the characteristics of users within a particular goal category and target them more effectively when formulating questions.

CONCLUSION

A social Q&A service serves as one venue for social search in that it enables people to interact with a distributed and larger group of unknown people. This study examined how people use a social Q&A service with respect to their search goals, strategies, and outcomes. Our findings show that

when participants used a social Q&A service, they were not always looking for answers to specific questions. Sometimes, they chose this venue simply to engage in what we describe as “searching for fun.” In addition, as people engaged in interactions with others they did not know in the process of social search in this setting, they developed a variety of strategies when formulating their questions, showing a preference for either answer quantity or answer quality depending on their search goal. The difficulty in distinguishing between informational outcomes and social outcomes may indicate the complex dynamics of social interactions in social search. This work contributes to our knowledge about social aspects of online information seeking behavior in a social Q&A context, and provides insights into improving the design of social Q&A services.

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