

# Self-Generated Versus Imposed Tasks in Collaborative Search

Robert Capra, Beth Sams, Paula Seligson\*

School of Information and Library Science

University of North Carolina at Chapel Hill

bsams@unc.edu, rcapra@unc.edu, seligson@email.unc.edu

## ABSTRACT

Prior research has suggested differences in search experiences between people working on self-generated search tasks versus imposed (e.g., assigned) ones. These differences are not well understood in the context of collaborative information seeking. In this paper, we review prior research on differences between imposed and self-generated searches, discuss how these differences may apply in collaborative settings, and describe a study we conducted to measure potential differences. Participants in the study collaboratively completed five Web search tasks (four assigned and one self-generated) while sitting at different computers and communicating via instant messaging. We describe details of the study and present results from one of our dependent measures – task engagement.

## Keywords

Collaborative information seeking, information sharing

## INTRODUCTION

Information seeking tasks may originate from different sources. For example, a search task may be undertaken by an individual based on their own personal information needs, or conversely, a task may be given to a searcher by someone else. This basic difference can be characterized as the source of the motivation for the query – intrinsic or extrinsic. Melissa Gross characterized this dichotomy as *self-generated* versus *imposed* queries (Gross, 1999) and examined differences between the two. While differences between these two types of queries have been studied for individual searchers, less is understood about how they might influence collaborative information seeking. In this paper, we focus on examining self-generated versus imposed queries in the context of collaborative information seeking.

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\* Authors listed alphabetically. The study reported was conducted as part of second author's undergraduate honors thesis.

We believe it is interesting to study distinctions between imposed versus self-generated tasks in collaborative settings for several reasons. First, these two types of tasks occur commonly in collaborative search. We observed these types of tasks in our prior interviews and studies of “everyday” instances of collaborative search (Capra et al., 2010; Capra et al., 2010b; Capra et al., 2010c) and others have also noted similar distinctions as well (e.g., Morris, 2008; Evans and Chi, 2008). Examples of imposed tasks include: a teaching assigning a group a research project. Examples of self-generated tasks include: a group of friends searching about activities for planning a vacation together. Second, the notions of self-generated versus imposed may provide useful distinctions in the design of collaborative search systems. Different types of support for search goals and searcher roles may be suggested by these distinctions. Third, different evaluation metrics may be appropriate for self-generated versus imposed collaborative search tasks.

To explore possible differences between these task types, we conducted a laboratory study in which pairs of participants worked on a set of imposed queries and a self-generated query created by the pair. In this workshop paper, we describe details of how our study was conducted, what data we collected, and present analysis of one measure – task engagement.

## RELATED WORK

### Imposed versus Self-Generated Queries

Melissa Gross (1995) introduced the term “imposed query”, using it to distinguish a self-generated information need from one that has been given by another person:

*“...people are seeking information not because they have identified an information need themselves, but because they have been set on that course by another. The information need or question he or she wishes to answer is not his or her own in the sense that it was generated in his or her own mind or out of the context of his or her own personal life. Rather, the question has been imposed upon him or her by someone else.” (Gross, 1995, p. 236)*

Imposed queries may result from classroom assignments, tasks given by a supervisor, or even requests by a friend. Such imposed queries are common in everyday life. In a

study conducted at a public library, Gross found that approximately 25% of the transactions at the adult reference desk were for someone other than the person making the inquiry (Gross & Saxton, 2001). Recently, in a study of social search, Evans and Chi (2008) found that one-third of their respondents reported queries that were motivated by external sources.

In some of contexts, the person conducting an imposed query is acting as a sort of intermediary (Gross, 1995), retrieving information for the imposer. In other contexts, the imposer may take on a collaborative role in the search. In the study described here, we consider situations in which an imposer gives a search task to a group who will explicitly collaborate on the search, acting for the most part without additional intervention from the imposer. Such situations often arise in business and academic settings; for example, a teacher assigning a research paper to a small group of students. For self-generated collaborative searches, our study considers situations in which the collaborators are jointly interested in the search. For example, a group of friends planning a vacation together.

Prior work has found differences between imposed and self-generated searches. In a study of users of public library reference desks, Gross found that users working on an imposed query rated their library experience more highly than did users working on self-generated queries (2002). Gross hypothesized that this difference might be because users working on self-generated queries were in a better position to critique results than the agents working on imposed queries. In a separate study, Gross (1999b) found that children used more and a greater variety of sources for imposed queries rather than self-generated queries, although this result may have been confounded by teachers providing initial research material required in the assignments.

Bilal (2002) extended Gross' dichotomous characterization of self-generated versus imposed queries to include an intermediate type: semi-assigned. Bilal defines *fully assigned* tasks as "those that have both the main topic and aspects of the topic imposed on the user", *semi-assigned* tasks as "those that have only the main topic imposed on the user, and the user can choose an aspect of the topic that interests him or her to pursue", and *fully self-generated* tasks as "those that have both the main topic and an aspect of the topic generated by user" (Bilal, 2002, p. 1171). In studying the experiences of children searching individually with these three types of tasks, she found that they preferred and were more successful at the self-generated tasks.

In their study of social search, Evans and Chi (2008) also found differences based on the motivation for the query. When their subjects performed self-motivated queries, they interacted with others less: for self-motivated queries, 30.1% of their participants reported talking to

others, whereas with externally-motivated queries, 70.2% reported doing so.

In a study of participant-defined tasks versus researcher-defined tasks and the search strategies utilized during both, Thatcher (2006) found that users employed different search strategies depending on the situation. Thatcher's subjects performed two self-generated and two assigned queries with one of each category being a directed search and the other being a more general purpose task. Thatcher concluded that the researcher-defined tasks were associated with more analytical and safer strategies when compared to the more intuitive and personal strategies used for the participant-defined tasks. He also found that, in researcher-defined tasks, participants used strategies that would take them on the most direct path to an answer. This finding meant that the search strategies had more to do with whether the researcher or participant defined the task rather than the task itself (Thatcher, 2006).

## RESEARCH QUESTIONS

For this paper, we present analysis of one of the dependent measures we collected – task engagement. We hypothesize that people will be more engaged in self-generated tasks than imposed ones. We base our hypothesis on results from Bilal (2002) showing that children preferred and were more successful at self-generated tasks.

In our study, we examined additional differences across self-generated and imposed collaborative search tasks, including time on task, use of the collaborative strategy of division of labor, the use of chat logs, the number of bookmarks created, and the number of problems encountered. These analyses are not included in this workshop paper, but many can be found in (Sams, 2011).

## METHOD

We conducted a laboratory study that involved pairs of individuals performing search tasks that included a set of imposed queries and a single self-generated one. Participants sat in the same room, but worked on different computers so that they could not see each other's screens. Participants were instructed not to communicate with each other in any way except through a collaborative software system installed on the computers.

We recruited undergraduate participants through an opt-in mass mailing list at our university. Participants were recruited in pairs who had known each other for at least 6 months prior to the study, who had previously worked together on some project, and were at least 18 years old.

A total of 12 pairs of participants (24 participants total) performed the searches using a Firefox Web browser extension called Coagmento (Shah, 2010). Coagmento provides several features to support collaborative

information seeking, including a toolbar with a button to create a shared bookmark, and a sidebar with an instant messaging/chat feature and a display of the shared bookmarks. We modified Coagmento so that when participants bookmarked a page, a message was automatically posted in the chat window indicating who bookmarked the site. This message included a clickable link to the site.

Each pair of participants completed five tasks: one self-generated task and four imposed (assigned) tasks. The four imposed tasks were the same for all pairs and consisted of: 1) a transactional query, 2) a fact-finding query, 3) an exploratory "collection" query, and 4) an exploratory "decision-making/planning" query. The four imposed tasks are shown in Table 1.

| Task type                      | Task description  |
|--------------------------------|---|
| Transactional                  | What is the URL that would let you add a KitchenAid 3-speed blender to your shopping "bag" on the Kohl's website?                           |
| Fact-finding                   | What is a prime factor?   |
| Exploratory: collecting        | Research for a report on the effects of childhood obesity in the U.S for a class on public health.  |
| Exploratory: decision/planning | Find activities you would like to do on a spring break trip to Tucson, AZ (chosen since it would be an unfamiliar city to our participants) |

**Table 1. Imposed Tasks**

The fifth task was chosen by the participants when they signed up for an experimental timeslot. Each pair was asked to think of a short list of topics or tasks that they would like to work on during the experimental session. We instructed the pairs not to begin any searches on the tasks on their list before the experiment. Then, at the time of the study, the each pair choose a self-generated topic from their own list.

The order of the tasks was balanced according to the following constraints. The first two tasks were balanced among the fact-finding and transactional tasks. The self-generated task was balanced between the third and fifth position. Then, the two types of exploratory queries (collecting and planning) were balanced in either the third and fourth, or fourth and fifth positions.

Participants were instructed to use Coagmento to bookmark websites that they found useful and wished to save from their searches. The pair was allowed to work on each task for as long as they wished. When the experimenter instructed the participants to start each task, a message was entered into the chat log. Similarly, participants were instructed to enter a message into the chat log to indicate when they had finished each task. The instant message logs, bookmarks, and search transactions were all saved. After a task ended, the participants were asked to fill out a brief questionnaire about their

experience with the task. To measure engagement, we included a series of items adapted from Ghani et al. (1991) that used seven-point bipolar scales. Participants were asked to complete the scales below with the prompt, "How you felt when you were completing the task":

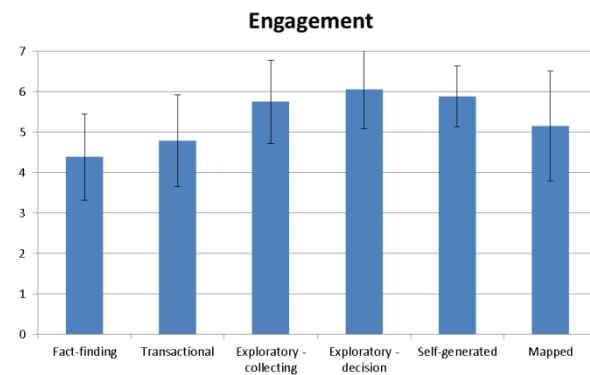
|                           |               |                       |
|---------------------------|---------------|-----------------------|
| Not absorbed intensely    | ○ ○ ○ ○ ○ ○ ○ | Absorbed intensely    |
| Attention was not focused | ○ ○ ○ ○ ○ ○ ○ | Attention was focused |
| Did not concentrate fully | ○ ○ ○ ○ ○ ○ ○ | Concentrated fully    |
| Not deeply engrossed      | ○ ○ ○ ○ ○ ○ ○ | Deeply engrossed      |

We included additional measures in the study such as time on task, use of division of labor, enjoyment, use of the chat log, and number of problems encountered. Analysis of these measures are not presented here, but many are included in (Sams, 2011).

## RESULTS

In this paper, we report results of the self-reported measure of engagement across the different task types. In addition to direct comparisons across the five tasks, for each pair of participants, we analyzed the self-generated task they generated and mapped it onto one of the imposed task types. For example, the self-generated task for one group may have been an exploratory-collecting style task, while for another group it may have been an exploratory-planning style task. We conducted this mapping process in order to help untangle the effects of imposed versus self-generated from effects due to the different task types. Our goal was to compare *the one* self-generated task from each group to *one of the four* imposed tasks that mapped most closely to the task type of the self-generated task. In the results below, we include an entry labeled "mapped" that is, for each group, the imposed task that mapped most closely to the self-generated task.

Figure 1 shows the average engagement level for each of the tasks. An independent-samples t-test showed a significant difference in the engagement for self-generated ( $M=5.89$ ,  $SD=0.76$ ) and mapped ( $M=5.16$ ,  $SD=1.36$ ) tasks;  $t(46) = -2.29$ ,  $p = 0.03$ . That is, the participants felt more absorbed on the self-generated task than on the mapped task.



**Figure 1. Levels of Engagement**

## DISCUSSION

These results validated our hypothesis that participants would feel more engaged with the self-generated tasks than the imposed tasks. They also suggest other differences that may play important roles in how groups collaborate on self-generated and imposed tasks.

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