

**Critique of Marchionini's Theory of Information Seeking Behavior as Seen Through the
H1NI Pandemic Fears and Vaccine Uncertainty**

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Abstract

Gary Marchionini, a former professor at the College of Library and Information Services at the University of Maryland, has set up a theory about how people seek information through electronic means. However, his model falls short when it comes to how people seek information in times of crisis. One such crisis was the rise of H1N1, commonly referred to as swine flu, in the spring of 2009. Within a few months, swine flu had been dubbed the next great pandemic and experts were trying to develop an effective vaccine. Although a vaccine provided hope that the flu would not be so deadly, it also raised another set of concerns regarding safety. In this climate of uncertainty, people were searching for answers, and how they did so was different than how Marchionini outlined in *Information Seeking in Electronic Environments*.

A variable that Marchionini neglected to take into account in his model of information-seeking behavior was fear. Fear is a powerful emotion that alters reactions greatly. By not taking crises and fear into account, Marchionini has overlooked a major area in which people may seek information. To study how fear affected how people looked for information during the swine flu outbreak, people visiting doctor's offices or queuing for the vaccine could be interviewed as part of the patient intake process and then again some time later.

Introduction

Information seeking is a fundamental ability of human beings and a function of our free will. We are able to identify a knowledge deficiency, look for information, and fill that void. This is an ongoing process that humans unconsciously engage in. Gary Marchionini has taken a step back from the seemingly automatic nature of the information seeking process and classified it into various interrelated subprocesses that are in turn affected by a number of factors. Despite

his thorough classifications, however, Marchionini does not make concessions for how information seeking is different in times of crisis.

Subprocesses

According to Marchionini, there are eight subprocesses that make up information seeking as a whole. They include recognizing the need for information, defining and understanding what the problem is, selecting a search system, developing a query, carrying out the search, looking at the results, gathering information from those results, and reflecting on the process (Marchionini, 1995).

The first subprocess is recognizing that information is needed. This can either be externally motivated, such as one's boss requesting a comparison between two integrated library systems, or internally motivated, such as wanting to figure out how to make an effective compost pile. Once the deficiency is recognized, the information seeker can suppress the problem or accept it and move on to the next subprocess. Marchionini (1995) indicates that a number of factors induce the information seeker to accept the information problem, such as the setting and knowledge of search systems, but this narrow focus does not take into account the fear surrounding a crisis (p. 51). Deciding to find information about composting kitchen scraps does not carry the same weight as deciding to find out about a potentially deadly flu.

Marchionini's next step in the information-seeking process is to define and understand the problem. He identifies this as an ongoing process as long as the information seeking goes on and is dependent on what the seeker already knows and says, "To understand and define a problem, it must be limited, labeled, and a form or frame for the answer determined"

(Marchionini, 1995, p. 52). If the information problem is entirely new with no precedent, however (like a new strain of flu), it will be very hard to complete this step.

Next, the information seeker must identify a search system. Marchionini (1995) dictates that identifying a search system depends on both past experience and current understanding (p. 52). With an undefined problem, it will be difficult to complete this step, also. While the seeker can physically choose a search system with an undefined problem, it is less likely that the one they select will meet their needs when they do not have a concrete understanding of the problem. Although their personal information infrastructure may contain familiarity with looking for medical information, the swine flu that emerged in the spring of 2009 was entirely new, and thus their previous experience may not be relevant.

Formulation of a query is the next subprocess that Marchionini identifies, and it too hinges on understanding and limiting the problem. Marchionini (1995) states that the first query formulation is a way to enter the search system, and the query can then be further refined (p. 53). But what to ask? If one cannot limit the problem, then how can they formulate a query? Although Marchionini (1995) does acknowledge that "...[P]roblem definition...remains active as long as the information seeking progresses" (p. 51), it seems that instead of the problem being redefined, additional problems would occur simultaneously.

Marchionini selects search execution and results examination as the next two subprocesses. Examining results is "...dependent on the quantity, type, and format of the response and involves judgments about the relevance of the information contained in the response" (Marchionini, 1995, p. 55). Since judgment is subjective, it would be very difficult to determine relevance when the information seeker has very little foundation on which to build their search. If their personal information infrastructure is weak in regard to the topic they are

researching, it follows that they will have a difficult time deciding if the information they've found is relevant.

The final two subprocesses Marchionini defines are extracting information and reflecting on the process. Extracting information is a physical and mental process and can include copying and reading information in addition to analyzing it (Marchionini, 1995). Reflection on one's information search may often lead to a follow-up search if the initial query needs refinement.

Variables

Marchionini's subprocesses of information seeking do not occur in a vacuum. They are acted on by a number of variables, but these are still rather narrow when considered in a time of crisis. The most important variable is the information seeker because they are in a position to complete all the subprocesses. Furthermore, with every information problem they engage in, they refine and extend their information seeking skills (Marchionini, 1995). In the information seeker, Marchionini (1995) recognizes "...cognitive, physical, and emotional differences between and within individual persons do influence specific behaviors and general affinities and abilities" (p. 34). While he does acknowledge the internal factors within an information seeker, Marchionini does not explore how these factors are different in a time of crisis and how they may affect one's behavior.

The next variable, task, also largely depends on the information seeker. Tasks may vary in complexity and time they take to complete, but this also depends on how the information seeker acts on and reacts to their information problem (Marchionini, 1995). Available search systems, what they contain, and how they are accessed are a third variable, and a domain, or body of knowledge defined by relationships between its parts, is a fourth (Marchionini, 1995).

These variables, along with physical and mental setting and outcomes, work dynamically with Marchionini's subprocesses and make up information-seeking behavior.

Marchionini in the time of swine flu

In 2009, a new strain of influenza known as H1N1 or "swine flu" emerged as the next pandemic and caused great anxiety, especially since it seemed to affect people in the prime of life: "With the current H1N1 influenza, researchers estimate that people younger than 65 account for more than 80 percent of total deaths" (Sanders, 2010, p. 24). This unique feature was different from seasonal influenza, which traditionally affects older people. Furthermore, although a vaccine was developed, it took longer than expected to reach the mass market, and there were fears of damaging side effects. People were faced with the possibility of becoming infected with swine flu or getting administered an uncertain vaccine and they needed to find information about the implications of both. The way they sought this information was different from Marchionini's theory.

Marchionini did not intentionally ignore crises in his model of information-seeking behavior. In fact, he said: "Emotionally, technology has relieved some of the stress of communication in emergencies" (Marchionini, 1995, p. 16). With the rise of the Internet, social networking, smart phones, and other tools, it has become easier to stay in touch. However, Marchionini assumes that the process of gathering information is systematic: "A systematic process is characterised by default transitions from one sub-process to another, which are likely to take place frequently. For example, query formulation is followed by query execution and query examination comes after query execution" (Ye, 2000, p. 112). Considering the chaos that ensues after a crisis, it is unlikely that someone seeking information will follow Marchionini's

linear path. Instead, it is more probable that the information seeker will formulate multiple queries simultaneously and try to resolve them all because they are undergoing the stress and fear of the crisis.

Swine flu was first recognized in April 2009 in Mexico, but it did not become world news until it spread around the country after the middle of the month (MacKenzie, 2009, p. 7). The swine flu was recognized as a potential pandemic by the World Health Organization (WHO) in early June, making it “the first declaration of a global flu pandemic in more than 40 years” (Kolus, 2009). Once this acceptance by the WHO became news, the wider public acknowledged the threat. Marchionini stated, “Acceptance is influenced by knowledge about the task domain, by the setting, by knowledge of search systems, and by the information seeker’s confidence in his or her personal information infrastructure” (Marchionini, 1995, p. 51). While people who were concerned about swine flu were likely influenced by the WHO’s declaration (setting), it is unlikely that they cared about the body of information out there regarding H1N1 (task domain), how much they knew about gathering information (search systems), or prior experiences they had (information infrastructure). In a potentially life-threatening crisis like the H1N1 pandemic, an information seeker will try and learn what they can do to stay healthy, not debate the finer points of a database. Although identifying a reliable and authoritative database is important, information is the utmost goal, especially when that information is scarce.

Definition and understanding is Marchionini’s next subprocess. The WHO defined the crisis for people, declaring that an influenza pandemic loomed on the horizon. However, it can be argued that people who were panicking and seeking information about the flu did not necessarily understand what was going on. They may have wondered, who is getting sick? How did they get sick? Will I get sick too? Young people are dying the most—are my children going

to die? These are just some of the concerns that people may have had regarding swine flu. This specific strain of H1N1 was rather unknown before April 2009: “The current pandemic, known to many around the world as swine flu, suffered an image problem in its early days.

Misinformation led to mass slaughters of pigs in misguided attempts to halt the virus’s spread” (Sanders, 2010, p. 26). Even those studying H1N1 were (and still are) unsure about how the virus may mutate: “ ‘Once we think we have this virus figured out, the virus shows us otherwise,’ says influenza expert Daniel Perez of the University of Maryland in College Park” (Sanders, 2010, p. 23). An information seeker’s knowledge is based upon what they already know, but in the case of swine flu, no one knew much of anything. Marchionini said, “To understand and define a problem, it must be limited, labeled, and a form or frame for the answer determined” (Marchionini, 1995, p. 52). The problem of H1N1 could not be easily limited or labeled and therefore was harder to define.

At this point, it is hard to continue with Marchionini’s subprocesses because the problem is not well understood. It is clear that the flu is a problem, but there is a lot of conflicting information that leads to confusion. While choosing a search system is his next step, the pieces that the information seeker needs to do so are not in place. They have no previous experience with the task domain and their information infrastructure is not equipped to make sense of the H1N1 crisis. Even for those with prior experience, it can be hard to determine a next step. The news media included some disturbing stories, such as that of Joan Bishop, a disaster preparedness expert who had drafted pandemic plans for both the Department of Defense and the Department of Health and Human Services. Despite her information infrastructure, she ended up with two of her three children contracting swine flu (“Pandemic hits their home,” 2009). Such cases made sensational national news because they were good stories, but they left the impression that no

one was safe. If the problem cannot be fully understood, then a search system cannot be properly chosen and the rest of the sequence cannot be adequately completed.

A similar situation occurred when a vaccine for H1N1 was developed. People had already recognized that swine flu was a problem, but now a new information gap appeared—a new vaccine against this strain of flu. Some questions that arose were, who should get the vaccine? Is it safe? What are the side effects? In both the case of the flu itself and the development of the vaccine, there were so many similar problems inextricably linked together that defining them individually was impossible. Marchionini's linear chain of subprocesses could not be followed.

Fear as an additional variable

In the case of the swine flu pandemic and the vaccine concerns, fear was a major variable. Since the flu affected young people the most, parents were concerned for their children. Lyn Finelli, head of the Center for Disease Control (CDC) swine flu response team, indicated that there were two to three times as many childhood deaths from confirmed swine flu cases than in a regular year, but the number was probably much higher since not everyone who died from swine flu was tested for it ("Flu targets vulnerable kids," 2009).

In an interview about swine flu, epidemiologist Philip Alcabes confirmed that being warned about a potential pandemic arouses fear, especially against the backdrop of the killer flu of 1918. Since a pandemic is in our past, it must come around again and when it does, it validates our fears (Fillion, 2009). Also, being warned about pandemics in the past have caused people to stockpile food and medicine, boycott travel and public gatherings, and blame particular groups of people for the outbreak (Goodwin, Haque, Neto, & Myers, 2009). The swine flu holds

a unique fear for some because a vaccine for a similar flu in 1976 caused Guillain-Barré syndrome, an autoimmune disease that goes after the central nervous system (“H1NI and its descendents, 2009). While some people wanted to be vaccinated against the flu, they were concerned about Guillain-Barré or other potential side effects. For example, thimerosal, a compound added to vials of multiple dose swine flu vaccine, has been found in worldwide research to be associated with dysfunction of the brain and immune system as well as autism (Saputo & Belitsos, 2010).

Marchionini’s theory does not account for fear as a variable. He acknowledged that “cognitive, physical, and emotional differences between and within individual persons do influence specific behaviors and general affinities and abilities” (Marchionini, 1995, p. 34) but did not look at fear and how it affects information seeking. His theory covers the broad spectrum of information seeking, but when it comes to crises and fear as a variable within those crises, his model is too narrow

Methodology

Since it is evident that Marchionini’s theory is not broad enough to encompass crises, how should one go about researching how people react in crisis situations? In the case of swine flu, a standard form could be included with a patient intake form if someone goes to the doctor and suspects they have the disease. The form could include questions such as, when did you first hear about H1N1? What was the source of the information? What makes you think you have swine flu? A similar form could be included when one goes to get vaccinated against H1N1. Including standardized answers will make the results easier to analyze and may make clear how people heard about and sought information in a crisis.

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