

Effect of Institutional Factors on Source and Channel Use by Medical Residents

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ABSTRACT

An important question in information-seeking behavior is how people decide on which information source to use when they need information for their work-related tasks. This question becomes especially pertinent in light of the varying degree of legitimacy accorded to digital sources, and the use of new channels of access such as mobiles and tablets. Building upon an earlier study on source use, and using the institutional theory, this is a report of a survey-in-progress of medical residents in one or more Boston hospitals. The study will also examine the role of serendipity in source choice when residents encounter information when not consciously looking for it. Insights gained from the study will build on past work on information behavior and source choice, as well as the application of institutional theory to hospital settings. It will help hospitals make optimal provision of information source types based on their preference and usage by medical residents.

Keywords

Information seeking, source use, channel use, institutional theory, medical residents.

INTRODUCTION AND LITERATURE REVIEW

An important question in information-seeking behavior is how people decide on which information source to use when they need information for work-related tasks. Some past studies reported that seekers use the source that is most easily accessible, while others found that people go for the source with the highest quality. Addressing these

conflicting findings using contextual variables, a survey study of 352 working professionals (Agarwal, Xu and Poo, 2011) found that quality (benefit) was the important factor in the use of a source. Accessibility (cost) was perceived by the seeker to be unimportant but was found important in their actual behavior. While this study looked at knowledge workers from the finance and information technology fields, not much is known about the effect of contextual factors on the source-choice behavior of medical residents, though there have been studies on the information behavior of healthcare providers in hospital settings (see Case 2007, pp.265-272 for a review).

A medical resident is a person who has a medical degree and is training (specializing in a particular field) under the supervision of a fully-licensed physician in a program accredited by ACGME, the Accreditation Council for Graduate Medical Education (www.acgme.org). In a typical program e.g. Internal medicine, the residents undergo 3 years of training. During the first year, they are called interns and in the following two years, they are called residents. During their 3 years of training, the residents undergo different rotations ranging from clinics to in-patient floors to critical-care units to electives and research. When residents look for information about their patients, they may consult the following sources: 1) their own colleagues or senior residents, 2) ask the designated *Attending(s)*, 3) consults physicians from other specialties, 4) go online and look for information in a knowledge repository e.g. upToDate (www.uptodate.com), 5) refer to internet sources e.g. Google, 6) consult medical journals e.g. New England Journal of Medicine (NEJM), or 7) consult medical books.

This question of source choice behavior of medical residents becomes especially pertinent in light of the varying degree of legitimacy accorded to digital sources (e.g. a hospital might give more legitimacy to a professional digital source such as upToDate and NEJM, and less to a general digital source such as Wikipedia).

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Institutional legitimacy plays an important role in determining which sources and channels an information seeker might use. Institutional theory defines three mechanisms that influence how a source will be perceived with regard to its legitimacy (see e.g. DiMaggio & Powell, 1983; Scott, 2004; Appari, Johnson and Anthony, 2009): 1) *coercive* pressures come from an external source and apply pressure directly on the institution, either through legal mandates, directives, or some other form of influence; 2) *mimetic* pressures arise from uncertainty, as the institution attempts to imitate a successful practice that others are doing, and 3) *normative* pressures come from other members of the institution, and generally results in similar ideas and practices (DiMaggio and Powell, 1983). A combination of these three factors gives rise to what we call the concept of *institutional legitimacy* to a particular information source that a medical resident might use for patient-care related tasks.

Also, the use of new channels of access such as mobiles and tablets bring in new dimensions to source and channel use by residents. Finally, residents might encounter information when they are not really looking for them (see the concept of information encountering by Erdelez, 2005).

Using the institutional theory, use of new channels and concepts on serendipity in information behavior, this is a report of a study-in-progress surveying medical residents in one or more Boston hospitals. The research questions that we seek to answer are: 1) *What are the conditions that make people switch from interpersonal sources (e.g. colleagues) to physical sources (e.g. books/manuals) to professional digital sources (e.g. a database such as UpToDate) to general digital sources such as Google or Wikipedia?* 2) *Does the degree of institutional legitimacy accorded to a source moderate its use?* 3) *Does the choice of channel (e.g. face-to-face, computer or mobile/tablet) moderate source use?* 4) *What is the role of serendipity in the information behavior of medical residents?* The

questionnaire has been designed and the study protocol and the questionnaire approved by the Institutional Review Board (IRB) of Simmons College, Boston.

Insights gained from the study will build on past work on information behavior and source choice, as well as the application of institutional theory to hospital settings. It will help hospitals make optimal provision of information source types based on their preference and usage by medical residents.

RESEARCH MODEL AND HYPOTHESES

The research model of Figure 1 shows the variables of this study. The dependent variable is change in source use, either in the amount, order, or frequency of use. Independent variables include change in source quality and change in choice of access channel. A mediating variable is change in source accessibility. Here, change is based on the difference between the current perception of a source, and the perception of that source by the resident when s/he first joined the hospital. We define type of source as one of four types: 1) interpersonal - people who work in the same hospital e.g. attending, consult, another resident, nurse, etc. 2) printed sources - books, journals e.g. NEJM, manuals, etc. 3) professional digital sources - electronic databases of medical resources/journals, e.g. upToDate, NEJM, etc. 4) general digital sources e.g. Wikipedia, Google, company websites, etc. We define access channels as one of four types: 1) laptop, 2) desktop, 3) smartphone and 4) tablet. The degree of institutional legitimacy of the source based on the three types of pressures – coercive, normative and mimetic is a moderator. Control variables will be age, degree of IT savviness, change in job scope, as well as serendipitous discovery of information. The hypotheses are listed below:

H1: Decrease in source quality will lead to a decrease in a) frequency b) amount and c) ranking of source use.

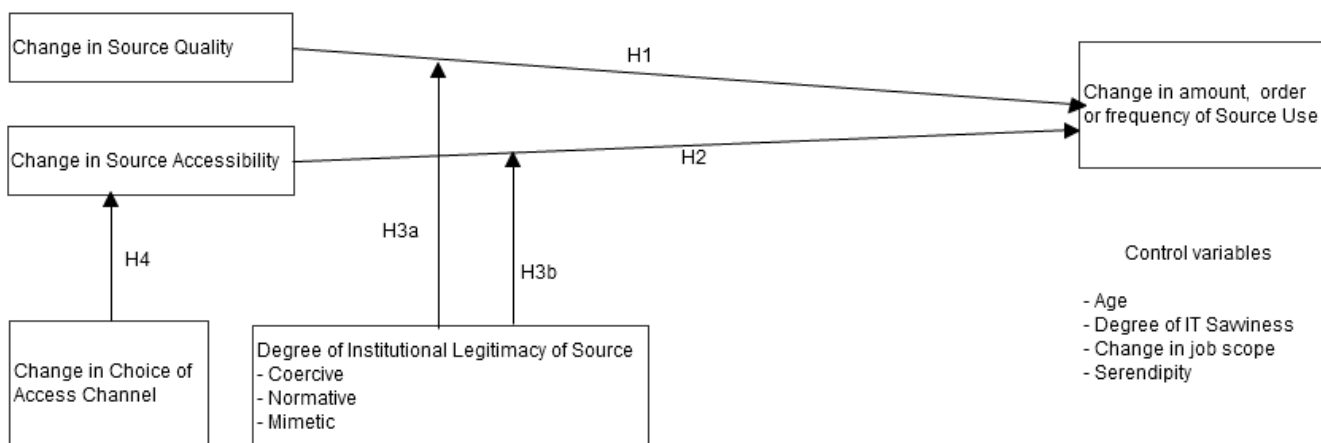


Figure 1. Research Model

H2: Decrease in source accessibility will lead to a decrease in a) frequency b) amount and c) ranking of source use.

H3a: Degree of institutional legitimacy of a source moderates the relationship between change in source quality and change in source use. In the presence of i) coercive ii) normative iii) mimetic pressures on certain sources, decrease in source quality will not lead to a proportional decrease in source use.

H3b: Degree of institutional legitimacy of a source moderates the relationship between change in source accessibility and change in source use. In the presence of i) coercive ii) normative iii) mimetic pressures on certain sources, decrease in source accessibility will not lead to a proportional decrease in source use.

H4: Change in choice of access channel affects change in source accessibility.

METHODOLOGY

As the constructs in our model deal with perceived attributes, a questionnaire survey will be conducted to test our hypotheses. The questionnaire has been designed and approved by the Simmons College IRB. Both a paper and web-based version of the questionnaire has been designed. The survey will be sent out to medical residents in a Boston hospital. Whenever available, the measurement items for the study were adopted from prior literature, else new items were developed. The questionnaire uses a seven-point Likert scale (1=strongly disagree, 7=strongly agree) where applicable. We first validated the instrument. Experienced researchers in the field were consulted to discuss the wording of each item. The instrument was revised based on feedback. Next, a pre-test was done with physician(s) to fine-tune the instrument. As the sample size is likely to be relatively small, a full-blown pilot study will not be conducted (though the first round of data collected will be analyzed to check for any problems in the questionnaire). To validate the convergent and discriminant validity of the instrument, psychometric analysis will be performed as per the procedure recommended by Anderson and Gerbing (1988). Exploratory Factor Analysis (EFA) with varimax rotation will be performed on the initial round of data using SPSS. The rotated component matrices for the pilot data set will be reported and analyzed to see if the survey items load correctly as per the respective constructs.

Subject Population

For the main data collection, the target population is medical residents. The study population is the medical residents engaged in a residency programs in a Boston hospital(s). The majority of the respondents will be medical residents (though physicians in other roles such as attending, consult, etc. will not be barred from participating). The criteria for inclusion in the study will be any physician in his/her first, second or third year of a United States medical residency program. Any other physician such as Attendings associated with residents will

also be included in the study. Depending on access, it is anticipated that between 50 and 200 residents will participate in the survey (which will be administered in the written format when available, while the rest will be sent online versions to complete), and are expected to range in age from late 20's to mid 30's, consistent with the average age of most US medical residents. The participants will be a mix of both male and female, and should come from a variety of racial and ethnic backgrounds and nationalities. Participants are anticipated to be healthy, considering they are keeping up with the rigors of a residency program.

Subject Recruitment

Subjects will be recruited from one or more Boston hospitals. Explicit signatures of consent will not be sought as the research does not involve any conceivable risk or discomfort to subjects and the subject pool is not from a vulnerable population. Also, residents are extremely busy so seeking time from them to fill out a questionnaire will be at a premium. A brief disclaimer of voluntary participation would be sufficient considering the minimal risks. An incentive will be built in to participate in the study. Each resident will receive \$10 to participate in the study. 2 respondents will be randomly chosen to receive \$50 either in cash or in gift vouchers or gift cards.

Data Collection and Analysis

Descriptive statistics will be recorded. To measure the reliability of the measurement items, Cronbach's alpha will be reported. Measurement model testing will be done using LISREL to ensure high construct convergent and discriminant validities. A confirmatory analysis will be conducted for the data collected from the main study. Discriminant validity will be checked based on a construct correlation table. Finally, we will carry out the hypothesis testing using stepwise Linear Regression and Hierarchical Linear Modeling.

Next steps

The next stage in the study is sending out the survey to medical residents, and analyzing the data gathered to determine the extent to which the hypotheses are supported.

SIGNIFICANCE AND EXPECTED RESULTS

Case (2007) lists a number of reasons why attention on health-related information seeking is important (p. 265): 1) affluent lifestyles in many countries leading to not only longer life and better health care but other medical problems such as obesity, heart disease, drug abuse, etc. and higher expectations of health care systems by patients and consumers of healthcare; 2) medical research contributing to development of expensive drugs and procedures, which address health problems and extend life, but might make healthcare increasingly less affordable; 3) the debate over support of, and standards for, healthcare in the U.S. has become a prominent political issue (President Obama signed the Affordable Care Act in March 2010); 4) there has been a social movement to promote the active

involvement of patients in their own health care. See, e.g., patientslikeme.com (Case, 2007, p.265) Understanding the information needs of health care providers and consumers is also important for medical libraries as they develop their collections to meet the needs of consumers of health information (see, e.g., research reported in the Journal of the Medical Library Association, Journal of the American Medical Association, Journal of the American Society for Information Science and Technology, etc.), as well as specialty search engines devoted to health such as Healialia (healialia.com), Healthline (healthline.com) and WebMD (www.webmd.com/search) and providers of personal health record (PHR) systems such as Microsoft HealthVault and WebMD. All of these factors have contributed to an vast increase in health-related information and an increased need to stay informed about it (Case, 2007, p.265), both from the point of view of health care providers (physicians, nurses, dentists and administrators) but also to the public at large or consumers of health care. Insights gained from the study will build on past work on information behavior and source choice, as well as the application of institutional theory to hospital settings, and help hospitals make optimal provision of information source types based on their preference and usage by medical residents.

LIMITATIONS

There are several limitations to the study. As this study is being conducted from outside the hospital, access to medical residents is proving to be a challenge. The questionnaire needed to be modified on several occasions to conform to the expectations of the hospital and their concerns over privacy. Another hurdle arose in the form of time constraints, driven mainly from the authors' desire to administer the questionnaire to a senior group of residents, so that change in habits could be measured over a period of time. Ideally, a follow up to the questionnaire would include interviews of a smaller group of residents, allowing their behaviors to be more thoroughly examined. A time consuming schedule on the part of the residents (as well as access issues) will prevent any interviews from taking place.

FUTURE WORK

Future work would involve a larger scale study across an array of hospitals. A larger grant would be sought for this. As this study is examining institutional factors affecting source use, it would increase validity of the study to investigate the behaviors of residents outside of one or two hospitals in Boston.

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