Toward a Social Framework for Information Seeking

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1. Introduction

Since the increasing spread of the Internet across the population at large, there has been much commentary about how we live in an information age (Castells 1996). The idea that we live in a knowledge society predates the 1990's mass diffusion of information technologies (IT) and has been of interest to social scientists for decades (Bell 1976; Reich 1992). However, it is only recently that a myriad of information technologies have spread across all segments of the population, branching to every imaginable daily activity, putting them in the forefront of academic and popular discussions and debates alike (Katz and Rice 2002; Wellman and Haythornthwaite 2002; Howard and Jones 2003). Given this wide-ranging significance and relevance, it is of utmost importance to focus research on the specifics of how people seek, search for, access, find and make use of information, or human information behavior (HIB) (Spink and Cole In press).

Undoubtedly, the rapid spread of IT to an increasing portion of the population has made more information readily available to people than ever before. This aspect of IT prompted early commentators to express much enthusiasm for these technologies (Barlow 1997; Dizard 1997). Concurrently, however, others expressed concern that the riches provided by the new resources would not be distributed equally among different segments of the population (Anderson, Bikson, Law and Mitchell 1995; DiMaggio, Hargittai, Celeste and Shafer 2004). These concerns are related to the idea that mere *availability* of information does not equal *accessibility*, nor does it necessarily provide a realistic chance that people may come across the types of information of most interest or use to them (Hargittai 2000: 234-235). Consequently, to ensure equal access and that people find the information they need, library and information science researchers must strive for a better understanding of how people are accessing information and how this may differ across populations. HIB broadens our understanding of how people react to information by focusing in on specific groups and trying to understand the social framework of their information condition.

In this chapter then, we focus on new directions in the development of a social framework for understanding the information behavior of well-targeted groups in society. That is, we explore how one's social positioning influences one's information behavior which, in turn, influences the information-seeking behavior of the populations studied. We concentrate especially on HIB through information technologies, but base our discussion in a more general framework of HIB

behavior encompassing other sources. We integrate work from information science, sociology and other disciplines to argue for a more holistic approach to the study of HIB. We outline both conceptual and methodological challenges facing the field of HIB and, for each, suggest specific directions for future research.

In addition to drawing on research in the fields of information science, we also discuss contributions made to the topic at hand by the literature on the digital divide stemming from various social science disciplines (van Dijk 1999; DiMaggio, Hargittai, Celeste and Shafer 2004; van Dijk 2005). We aim to show that these areas have much to gain from each other and have some important commonalities that are worth exploring together. As the research program on the "digital divide" has moved toward looking at the various dimensions of digital inequality, some researchers have started to incorporate studies related to information-seeking into their agenda including explorations of skill (Hargittai 2002; 2003; Mossberger, Tolbert and Stansbury 2003) and IT competency (Bunz 2004). In this chapter, we draw on recent developments and challenges faced by the digital divide literature to gain a greater understanding of some of the ways in which work on HIB behavior should evolve.

2. Chapter Roadmap

We start in Section 3 by presenting a conceptual framework for studying the social aspects of HIB. We begin that section by discussing the ways in which people's social attributes (demographic characteristics, their socio-economic status) may influence what methods they employ for information seeking, searching and information use, and how successful they may be in these endeavors.

Next, we explore how the context of the user's actions matters. We consider several types of context that may be relevant to the topic at hand, from the level of autonomy people enjoy in accessing different types of resources to the extent to which they can draw on social support networks for assistance. Finally, we delineate the different types of HIB in which people may engage from the various goals and purposes that may guide their behavior to the types of sources and means they may employ in an attempt to satisfy their information objectives.

In Section 4, the methodological section, we consider challenges in the realm of both data collection and measurement. We start by a discussion of sampling concerns as we feel it will be important for the field to expand the populations under study. We then explore what methods may be most appropriate for some of the proposed research. Finally, we elaborate on some of the difficulties in operationalizing variables that we deem important in the study of social factors

relevant to information seeking. For each of these points, we draw on existing

literature to suggest strides that have already been made in advancing the

research agenda and outline challenges that remain. We end our chapter by

summarizing why we believe it is important to consider the social factors of

information seeking in studies of HIB.

3. Conceptual Framework

Much of the existing work on information seeking has focused on the technical

and cognitive aspects of the behavior often ignoring or only briefly mentioning the

relevant social factors in the process (Marchionini 1995; Case 2002). For

example, Spink (2002) notes in her Introduction to a Special Issue on Web

Search in the *Journal of the American Society for Information Science and

Technology* that "Social and organizational impacts and aspects of the Web are

not well represented in this special issue. A further special issue, including social

and organizational Web research is much needed" (p. 65). Here, we take this

observation seriously and consider the social aspects of both Web research and

information seeking more generally.

Since Spink (2002), researchers in library and information science (LIS) have

expanded their perspective on what should be studied in information seeking

research, making information seeking itself but one part of a broader picture,

which they call HIB. Information seeking is now just purposive information

seeking as information seeking research has traditionally examined the problem situation of the user, and the purposive information seeking done to solve the problem.

A particularly important milestone in this evolution from information seeking to a broader HIB approach is everyday life information seeking (ELIS) which focuses on the "small worlds" of the group being studied, particularly the social aspects or social situation of the studied group. Chatman (1991), for example, studied the social aspects of janitors, their small world which was divided into insiders and outsiders. Insiders share the same perspective, and this perspective has cultural, social and occupational aspects (Houtari and Chatman 2001). These aspects in turn are more important than any information coming at the small world from the outside that does not coincide with these aspects. The ELIS perspective examines and values the social context in which information is accepted or not accepted in a specific community group.

In this section, we start by making a case for the inclusion of people's social attributes in studies of information behavior. We discuss why ignoring variables such as gender, age and socio-economic status may lead us to draw mistaken conclusions about the HIB of the population at large. We draw on earlier work that linked such factors to differences among people's ability to perform various information-seeking tasks. We continue by considering the various types of contexts in which people may seek, search and use information and how these

contexts may influence their behavior. We also reflect on the different goals and purposes that lead people to seek information, and how research should be conscious of all these factors for a better understanding of HIB.

3.1 Social Attributes

Few studies in the information-seeking literature elaborate on subjects' social attributes such as gender, age, race, ethnicity, education and income. This is partly due to the fact that variance on some of these factors is often not present in the samples used by researchers to study related questions. Most studies in information seeking have traditionally looked at academics, students or university library patrons, because these populations are readily available for study.

In a LIS study of the information seeking channels used by African Americans living in a subsidized housing complex in Dallas Texas, Spink and Cole (2001) concluded that these residents lived in relative isolation, but nonetheless they had what was called an Information Environment that could be studied and had specific characteristics. Agada (1999) explored the information-use environment of African-American inner-city gatekeepers and noted that the needs in such a community and approaches to information seeking were different from those experienced in more privileged milieus. A user's socio-economic background may well influence his or her information-seeking behavior highlighting the importance of focusing on related variables in our explorations of HIB if we are to

develop an understanding of HIB that reaches past very particular privileged communities of people.

Given the large number of studies administered on undergraduate or graduate students, variables such as age and education are held constant (Case 2002). Nonetheless, even in such studies, ignoring other attributes such as gender may lead to drawing the wrong conclusions about certain subpopulations.

Work exploring possible gender differences in computer and Internet use has often found differences between how male and female users integrate these media into their lives (Schumacher and Morahan-Martin 2000; Boneva, Kraut and Frohlich 2001; Liff and Shepherd 2004). Although these studies did not focus on information-seeking per se, their findings that men and women perceive and use these technologies differently may have important implications for how people of different genders perform information-seeking tasks using IT.

HIB broadens the perspective on studies about possible differences between men and women and how they use IT. Are women more likely as compared to men to turn to their social networks for information? Do women incorporate and interpret material differently from men? These are relevant questions especially as IT services with important collaborative features become more widespread. The increasing spread of and reliance on IT in organizations may lead to changes in how responsibilities are allocated and work is conducted. Might the

incorporation of IT services have different results depending on the particular workforce due to interaction effects of gender? If it is a variable we ignore in our analyses then we will never know how generalizable certain findings are across population groups.

Age is another factor that should not be ignored in studies looking at how people find material of interest to them. There may well be generational differences in how people approach information-seeking tasks so ignoring this attribute of users will result in faulty generalizations about how different people may undertake a search task. However, it is not enough to make a simple assumption about the effects of age on information seeking behavior.

Older people are sometimes believed to be shy or slow with information technologies, but such approaches are rarely based on rigorous empirical evidence. Assumptions like this are, at times, considered as the only possible explanation of the particular ways in which the elderly use IT. However, the few related studies that do take a nuanced look at the mediating effects of age seem to suggest alternative explanations. Hargittai (2003), looking at the online behavior of one hundred adults in age ranging from 18-81, found that although older users were more likely to make typographical and spelling mistakes during the study, the effect of age disappeared once the statistical models controlled for use of a computer at work and experience with the Internet. Similarly, she found that although older users were less likely to find certain types of material online,

once the statistical analyses controlled for types of search methods used in certain instances, the effects of age disappeared on successful searching ability. Conversely, young people are often assumed to be the most savvy IT users. Yet empirical evidence exists to disprove this assumption. Nielsen (2005) found that teenagers were less successful than their adult counterparts in finding certain types of content on the Web.

It seems that design and social conditions of use (e.g. the availability of support and training) can alleviate generational differences. But we can only learn the in-depth reasons for differences in information-seeking behavior if we collect and include in our analyses enough detailed information about our participants, their demographic characteristics, the conditions of their use and experiences, and details about their information behavior.

To be sure, some studies have moved past undergraduate populations for studies of information behavior, but even in these cases variables such as race or income are controlled for by focusing on a narrow group of people affiliated with an institution of higher learning, a particular business environment or patrons of a library (Case 2002). Restricting variation on factors such as education and income potentially limits our ability to draw conclusions about the relationship of these attributes to the information behavior under study. Findings from the few studies that have explored information-seeking among less privileged

populations underscore the importance of including these groups in our work

(Chatman 1996; Agada 1999; Spink and Cole 2001).

3.2 Context of Information-Seeking Behavior

Information-seeking does not occur in isolation from one's surroundings. These

surroundings encompass a wide-variety of factors that influence people's

information behavior. In this section, we discuss why the availability of resources,

whether physical or social, should be a part of the framework that we use to

explore the nuances of HIB.

3.2.1 Autonomy

Hargittai (2003), while writing about Web-use skills in particular, defined

"autonomy of use" as "one's freedom to use the technology when, where and for

what purposes one wishes" (p.64). This definition can be expanded to

encompass autonomy of use regarding other media and sources of information.

The main concern is the extent to which the person seeking information has the

freedom and flexibility to consult the necessary sources at his or her leisure and

convenience.

Few studies of information seeking using computers are conducted in users'

usual natural environment where the subjects have at their disposal the particular

features of their everyday surroundings. If we do not collect and take into
consideration data about users' typical IT access and experiences, we may be
missing important information relevant for an in-depth understanding of HIB.
Having a network-connected machine at home where a user has round-the-clock
access to the medium is arguably different from having access at a university
terminal to which access is restricted by library or laboratory hours in addition to
the travel time to and from the location.

In fact, some studies have presented empirical evidence of how ease of home
access to a network-connected machine is associated with differentiated online
activities (Howard, Rainie and Jones 2001; Hargittai and Hinnant 2005). These
studies have found that users with home access are more likely to visit so-called
"capital-enhancing" Web sites (Howard, Rainie and Jones 2001) and are more
knowledgeable about the Web than those who do not go online at home
(Hargittai and Hinnant 2005). Capital-enhancing Web sites are Web sites that
have the potential to contribute to one's human capital, e.g. job searches, health-
information seeking, and utilization of government services (DiMaggio and
Hargittai 2002). (See below for further discussion.)

Another aspect of autonomy concerns the location of resources in the household
(or other site). Families (and various organizations) may take different
approaches to the integration of IT into their spaces. Some may purposefully
position technologies so they can be monitored by others in the user's vicinity.

This can influence the ways in which people go about their information-seeking and thus the types of habits and skills they develop. The home terminal may be in a family room where the user is never alone in viewing Web sites, or library machines may be lined up next to each other so closely that others sitting nearby can view one's screen restricting the exploration of certain types of material. In contrast, if the machine at home is in a private room or an employee has a terminal in a private office then the user will have much more freedom in exploring all that the medium has to offer.

Autonomy of use is relevant with respect to other information sources as well. Whether one is in need of accessing resources through the phone or in person, the level of privacy afforded in the particular environment may have significant implications for how one may address the situation. The reasons for the various degrees of autonomy in the use of information sources can be economic, social or cultural in origin. Whether due to financial constraints, legal reasons for monitoring user behavior, or cultural beliefs that suggest communal use of resources, differences in one's freedom to access information sources when, where and how one wants to can influence the types of information behavior in which people engage and the types of approaches they develop. Thus, ignoring this concept in our studies of information-seeking likely excludes important variables with significant implications for HIB.

3.2.2 Social Support

Another important factor influencing users' information-seeking behavior concerns the availability of social support networks to help address users' needs and interests. People's information behavior does not happen in isolation of others. Social theorists have long been interested in the myriad of advantages one can accrue from one's social surroundings (Bourdieu 1986; Coleman 1988). Growing up in a certain milieu affords one not only certain economic resources, but also social and cultural ones on which one can draw – whether directly or indirectly – to further one's goals. Given that asking others for guidance is an important source of advice for people seeking information, the ease of access to networks and the attributes of said networks have important implications for how people approach and address their information needs. Although a considerable body of literature has developed around exploring how people draw on their networks for information, much of this research has focused on communication within organizations (e.g. Contractor and Monge 2002) with much less attention paid to people's individual everyday life information behavior.

The literature on the diffusion of innovations long ago identified the importance of social networks in the process (Rogers 1995). Whether the adoption of certain products or practices, people rely on trusted sources in their personal networks to try new approaches to tasks in their everyday lives. Regarding the importance of available support for the use of IT, one study of home computer diffusion found

that those without friends or neighbors to call upon for help with the technology

were more likely to abandon its use than those who had people to consult with

challenges (Murdock, Hartmann and Gray 1992). Demographic characteristics

discussed earlier in this section are also relevant in these nuanced measures of

the conditions under which people utilize IT. For example, Kiesler, Zdaniuk,

Lundmark and Kraut (2000) found that teenagers were the most likely in families

to contact technical support for assistance with IT difficulties.

3.2.3 Goals and Purposes

Much initial literature in the field focused on information-seeking for occupational

or study purposes. The recently developed everyday life information seeking or

ELIS approach has highlighted the significant point that much important

information seeking happens in people's everyday lives unrelated to their work

(Savolainen 1995). Rather, people engage in active and passive information-

seeking behavior throughout their daily lives relating to activities from the

seemingly mundane tasks of getting weather or sports information to the

extremely serious actions of researching immediate health concerns. The types

of information sought constitute an important part of the process and should be

considered with care in studies of information seeking.

Often studies examining people's ability to find various types of content using

particular interfaces or the Web present participants with trivia questions whose

inclusion in the study seems haphazard. Rather, researchers should make conscious effort in identifying their proposed queries. Since many of these studies already take place in artificial settings, asking respondents to look for material they would likely never encounter in daily life adds another layer of abstraction to the research projects. Of course, if the goal is to have subjects look for something they would never have encountered otherwise then the trivia questions may be justified, but this should be stated up front in the project. In other instances, however, it would help further our research agenda to pick tasks that are conceptually motivated.

One proposed classification of activities draws a distinction between "capital-enhancing" and recreational activities (DiMaggio and Hargittai 2002). These authors argue that there are conceptual reasons for distinguishing between information-seeking behavior that has the potential to contribute to one's human capital (e.g. job searches, health-information seeking, utilization of government services) and information seeking that has recreational motivations (e.g. visiting gaming sites, following sport scores).

While an argument can be made that equitable access to the former should be of concern to policy makers, it would be harder to justify policy intervention for activities in the latter category. Consequently, researchers may want to take care in considering such a distinction in types of information sought when assigning tasks to respondents or when collecting data about the information-seeking

behavior of people in natural settings. Other categories that may be relevant to consider separately could include information-gathering for purchasing purposes or informing oneself about possible participation in computer-mediated communication (although even these could likely be organized according to the classification proposed above).

In this section, we have discussed the ways in which the conceptual framework for research on HIB must expand its reach to include social factors. Now we turn to addressing some of the methodological challenges posed by these propositions.

4. Methodological Framework

It is one thing to recognize the conceptual ways in which a field must evolve; it is another to find the right methodological tools to carry out the developing research agenda. In this section, we outline some of the challenges we face as we refine the variables in our models of information-seeking behavior. In particular, we address sampling issues and specific measurements of concepts introduced in the previous section. Although many of the approaches we mention have already been employed by some researchers, what we consider a main challenge to the field is to integrate the advances in the various areas into new studies that improve on earlier work on several dimensions (i.e. better sampling methodology coupled with more in-depth studies).

We will have to draw on diverse methodologies recognizing the strengths and weaknesses of each. Given the challenges and limitations of each methodology, multi-method studies may be the most fruitful.

4.1 More Diverse Populations

As we discussed in the previous section, much research in information seeking is conducted on convenience samples of undergraduate or graduate students at research universities. Such sampling techniques can be justified if a study is only about very select populations (especially relevant, for example, in the case of patrons of libraries), but must be expanded and diversified if we are to comment on the information-seeking behavior of more general populations. Too often authors apologize for the limitations in their sampling techniques by suggesting that theirs is a study exploratory in nature. While this is a necessary first step in the development of a new field, eventually the exploratory studies have to move to another level and be administered on samples that allow more generalization for a field to gain legitimacy.

It is too limiting to operationalize novice versus expert users as beginning versus advanced graduate students in an information science program (e.g. Ford, Miller and Moss 2001) when less than five percent of the population has graduate degrees and even college degrees are held by a minority of American adults. For

a study to claim legitimately that it is exploring the practices of novice versus expert users the researchers should reach out to populations with much less experience with the services under study than any student at a university would possess.

One way to categorize novice users is to consider subjects' overall experiences with the medium and services under study. For example, researchers may look at the number of years someone has been a user or the amount of time people spend with the medium on a weekly basis. Howard, Rainie and Jones (2001) did just that distinguishing between "newcomers" and "veterans" where the former had been online for less than a year before the study while the latter had been users for at least three years. These authors distinguished among the participants in their study further by considering additional information about daily usage and designating the most frequent users who had also been online for several years as "netizens". This particular project was conducted on a random sample of American adult Internet users making the findings of the analyses much more generalizable than studies conducted on very select non-random groups of people.

To be sure, we are not suggesting that experience measures be used as a proxy for abilities. To the contrary, Hargittai (2005) found that years of use or amount of time spent online are weak predictors of people's actual skills. In fact, she found that the former explains only a third, the latter only a sixth of the variance

in actual abilities compared to the stronger – albeit still limited – explanatory power of composite variables based on survey measures of skill. The idea is to use variance in the user experience variable to guarantee a diverse sample in our studies.

4.2 New Methods of Data Collection

Surveys can be helpful, but this field can often benefit more from other less traditional methods. Interesting and informative data can be derived from large-scale log analyses (Spink, Wolfram and Jansen 2001; Goldfarb 2002; Spink, Jansen, Wolfram and Saracevic 2002). Although such data can be hard to find as they are often proprietary, access to just one data set can be quite fruitful and lead to numerous publications. Jansen and Pooch (2001) offer a helpful review of Web search studies, many of them based on log analyses.

For an in-depth understanding of people's information-seeking behavior, in-person observations and interviews can be especially insightful (Hargittai 2002; Rieh 2004). Such studies are not uncommon in the LIS literature, but more often than not they are conducted in artificial settings and with a very particular set of tasks not necessarily reflecting conceptual motivations. A particular challenge of related approaches is finding the appropriate tools for the collection and analysis of data. These should also be related to the ultimate goals of the study. Whether one videotapes the subjects or records snapshots of the actions on a computer

screen should be motivated by what data will be the most helpful for addressing the research questions.

Carey, McKechnie and McKenzie (2001) explore the new challenges posed by conducting in-person observations in research on everyday life information seeking. Unlike much qualitative research in the area that ignores details about how researchers can gain access to particular populations under study, Carey and his colleagues give a detailed account of gaining and maintaining access to three specific groups: pregnant women, support groups and children. As they note, most studies do not present the reader with much information about the modes of data collection, a shortcoming future studies should address.

We have mentioned the importance of social support networks to the full understanding of HIB. Social network analysis often requires its own particular data gathering approach – a matrix with in and out links of participating actors or nodes – an approach that could prove invaluable for uncovering patterns of information behavior among members of a network that are currently difficult for LIS researchers to see lacking appropriate data sets.

4.3 New Measurements

Given the ever-changing nature of IT and the myriad of services offered by new technologies, and given the new directions in which we believe research in the

field should proceed, it is important to develop new measurements that meet the conceptual needs of progress for our research agenda. Here, we describe possible new measures for concepts discussed earlier in the chapter such as skill, digital literacy, autonomy of use and social support networks.

4.3.1 Skill and digital literacy

One way to compare HIB across population groups is to examine the extent to which different people possess the necessary skills to perform certain types of tasks having to do with information seeking, evaluation and use. The measures of performance will depend on the specifics of the study, but the following are some possible variables researchers may consider as indicators of skill and digital literacy: (a) success rate with tasks; (b) amount of time spent on tasks; (c) number of steps taken to achieve certain goals; (d) number of resources used to find information; (e) quality of information found; and (f) the ability to evaluate the located information.

While some of these measures are fairly straight forward (e.g. one can measure time in seconds or minutes), others can be much more nuanced and complicated, and may require the development of new coding and analysis techniques. It behooves the LIS research community to publish new methodologies so energy is not spent on reinventing the wheel with every project. Jansen and Pooch's (2001) review piece about Web searching studies

provides an important service to the community by presenting a summary table

of variables that had been used in previous studies about search queries (p.243)

giving other researchers in the field guidelines for the types of variables that have

proved to be helpful in past work. Hargittai (2004) published a separate article

just on the coding and classification scheme she employed in her study of one

hundred randomly sampled adult Internet users' online actions. The complexity of

the method attests to the fact that it would be a waste of resources for each

researcher in the field to come up with their own unique coding mechanism.

4.3.2 Autonomy

In Section 3.2.1, we discussed the importance of considering how one's

autonomy in information seeking may influence one's behavior. There are

numerous ways in which one might collect information about people's autonomy.

In her work on how a diverse sample of adult Internet users finds information

online, Hargittai (2003) measured autonomy of use in two ways: (1) the number

of locations in which Internet users had access to a network-connected machine;

and (2) whether users had an Internet connection at work, which they were very

free to use for the activities of their choice. Although her study was conducted in

a lab environment, multiple regression analyses that included information on

these variables predicting success with various information-seeking tasks

suggested a statistically significant relationship between autonomy of use and

online information-seeking skills.

Operationalizing autonomy of use as the number of locations of access or the freedom to use the medium at work are just two possibilities. Other potentially important factors that emerged through interview data in the above-cited study (Hargittai 2003) also suggested a need for considering the number and types of people with whom a user may have to share IT-resources in the home or elsewhere.

For example, parents sometimes find themselves with limited access to their home terminals due to their teenage children's monopolization of the medium. Since home access is usually the most autonomous regarding the type of material one may view (i.e. less likelihood of third-party surveillance, higher chance of finding time to browse freely without time constraints), considering the limits that may be put on it is important. In fact, some studies have already found these measures to have significant influence on the types of uses to which people put the medium indicating that those with home use are more likely to visit Web sites with capital-enhancing content (Howard, Rainie and Jones 2001; Hargittai and Hinnant 2005).

4.3.3 Social Support

In the previous section on new methods of data collection, we suggested that LIS researchers may want to start collecting matrix data appropriate for social

network analysis. In addition to that particular method, there are other ways in which one might assess the importance of social support networks to HIB. For one, social psychologists have developed relevant indexes for measuring general social support (Cohen, Mermelstein, Kamarck and Hoberman 1984). Regarding measurements related to information seeking in particular, possibilities include: (a) the types of ties or relationships available for informational purposes; (b) the number of ties or relationships in one's immediate or more distant network; (c) the amount of contact one has with knowledgeable relations in one's network; and (d) the level of expertise in one's network. These are just a few possibilities and researchers should experiment with others by including additional options in their surveys.

4.4 Concerns Regarding Measurement Validity

There are various ways in which the particular setting of a study or the type of data collection may influence the validity and thus the quality of measurements about HIB. Here we consider just some examples to highlight the importance of the careful considerations that must go into decisions about what particular measures to use to collect data about HIB. Although a number of projects on HIB look at people's actual actions in study settings, measures are often collected using proxies. This can be problematic as we often know little about the validity of such proxy measures. Not only might there be validity concerns regarding the

measure in general, but it may be that the measure is a good reflection for one sub-sample of the population while a bad one for another.

One study found significant gender differences in the validity of a proxy measure for online abilities (Hargittai and Shafer 2003). The study considered how well survey measures of Web-use skill reflected people's actual online expertise. It is rare that researchers look at measures of perceived abilities in the context of actual abilities. The results of this one study indicated that despite exhibiting similar levels of *actual online skill*, women tended to *perceive* their skills as significantly lower than men perceived their own skills. So while the proxy measures of Web-use skill may be a good predictor of *men's* online abilities, the measures work poorly as a proxy for *women's* online abilities.

This stream of research is related to an even broader area of inquiry regarding gender differences in attitudes about and abilities regarding math and science fields (Benbow and Stanley 1980; Hyde, Fennema and Lamon 1990; Etzkowitz, Kemelgor and Uzzi 2000; Margolis and Fisher 2002). Correll (2001), for example, found that net of actual abilities young women found themselves to be less skilled in math and science than their male counterparts. This in turn influenced their propensity to pursue math and science careers. Similarly, research has found that nuanced details about a study's context – e.g. what participants understand to be the goal of the study – may influence participants' performance

and achievements on tests across racial categories (Steele and Aronson 1995;

Steele 1997; Osborne 2001).

Although the focus of these projects was not on HIB per se, these examples

highlight relevant methodological challenges for the field. If significant differences

exist across demographic groups regarding perceptions of abilities and actions

then using proxies to measure behavior or neglecting to consider the particular

circumstances of the study may lead to misleading findings in some instances.

5. Conclusion

In this chapter, we have outlined conceptual and methodological frameworks for

incorporating social factors into the study of HIB. As the field matures, it will be

increasingly important to approach our research questions in a more holistic

manner and to include more nuanced measures of HIB than much of existing

work has done so. We have offered specific recommendations on how to do this.

Here we call attention to a few additional points we deem worthy of

consideration.

As information technologies evolve and the different services spread to an ever

growing number of devices, it will be increasingly difficult to distinguish certain

services based on the machines on which they run. That is, while in the 1990s it

made sense to restrict the study of Internet use to Web access using computers,

in the 21st century it becomes increasingly limiting to make assumptions about what devices people use to access different information sources. As phones and personal digital assistants gain functionality, it will be important to include a diverse set of equipments in our studies. As we argued earlier, conducting studies on subjects in research labs already adds an artificial component to the data collection process, but requiring participants in a project to use devices they do not normally consult for services will make findings especially difficult to interpret and generalize.

While we have mainly focused on the use of IT in this chapter, it is important to recognize and remember that much HIB continues to take place through more traditional channels. Incorporation of diverse media and a focus on the importance of social networks – whether accessed through IT, in person or through other means – will remain crucial for an all-encompassing understanding of HIB.

Finally, we would like to mention that many of the social factors whose importance we discussed in this chapter can be included in studies both as independent and dependent variables. Researchers will want to be careful with how they approach the various social attributes we discussed and should let the conceptual questions guide how variables are incorporated into future studies. For example, while skill can be considered a dependent variable where one examines the predictors of differential abilities (e.g. Hargittai 2003; Mossberger,

Tolbert and Stansbury 2003), it can also serve as an independent variable when one looks at its implications for different types of uses (e.g. Hargittai and Hinnant 2005).

While the research agenda related to HIB has made some significant strides in the past few decades, as we have argued in this chapter, the field faces new challenges as it matures. In particular, we have focused on the importance of incorporating social factors into our analyses. By considering particular socio-economic features of the populations under study and by expanding the characteristics of the groups whose behavior we investigate, we will gain a better, more encompassing and more generalizable understanding of HIB.

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