

Social relevance assessments for virtual worlds

Social
relevance
assessments

Interpersonal source selection in the context of chronic illness

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Abstract

Purpose – The purpose of this paper is to introduce the concept of social relevance assessments, which are judgments made by individuals when they seek out information within virtual social worlds such as online support groups (OSGs).

Design/methodology/approach – Constructivist grounded theory was employed to examine the phenomenon of information exchange in OSGs for chronic kidney disease. In-depth interviews were conducted with 12 participants, and their posts in three OSGs were also harvested. Data were analyzed using inductive content analysis and the constant comparative method. Theoretical sampling was conducted until saturation was reached. Member checking, peer debriefing, and triangulation were used to verify results.

Findings – There are two levels of relevance assessment that occur when people seek out information in OSGs. First, participants evaluate the OSG to determine whether or not the group is an appropriate place for information exchange about kidney disease. Second, participants evaluate individual users on the OSG to see if they are appropriate people with whom to exchange information. This often takes the form of similarity assessment, whereby people try to determine whether or not they are similar to specific individuals on the forums. They use a variety of heuristics to assess similarity as part of this process.

Originality/value – This paper extends the author's understanding of relevance in information science in two fundamental ways. Within the context of social information exchange, relevance is socially constructed and is based on social characteristics, such as age, shared beliefs, and experience. Moreover, relevance is assessed both when participants seek out information and when they disclose information, suggesting that the conception of relevance as a process that occurs primarily during information seeking is limited.

Keywords Internet, World Wide Web, Behaviour, Information science, Theory, Health

Paper type Research paper

Introduction

This paper describes how people diagnosed with a chronic disease assess the relevance of health information provided by other patients in online support groups (OSGs). Relevance assessment is typically framed as a dynamic process in which a user assesses the relevance of an object or a surrogate of that object. Our understanding of how people assess information provided by other people, however, largely remains limited to studies examining expertise location within formal work environments or to small worlds and information grounds, where co-presence is a key factor that shapes information behavior. There are few investigations of information seeking from human sources in other, less formal, contexts, particularly those that occur in online communities. This paper presents results from a two-year grounded theory study examining online health information behaviors among individuals diagnosed with chronic kidney disease (CKD). This paper offers a stratified model of social relevance assessments derived from the data, along with examples of the methods people use to assess the relevance of other individuals within OSGs for CKD. This model extends our understanding of relevance assessments,



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illustrating that they are made not only when seeking information, but also when disclosing information. The paper closes with suggestions for future research transferring the model to other contexts.

Literature review

Relevance

Relevance is generally understood as an assessment of the effectiveness of information exchange within a specific context; the exchange can occur between two or more people, or between people and information objects (Saracevic, 1996), and is complex and multidimensional (Borlund, 2003). In person-to-information-object exchanges, systems infer relevance by applying algorithmic analysis to a corpus of information objects or document. This is the type of relevance focused on by most scholarly literature on the topic. This algorithmic, or “systems-oriented,” relevance examines the relationship between user-generated queries and information objects within that system, which are retrieved by a specific algorithm or procedure. This research positions relevance as a quality inherent in the information objects being retrieved.

User-oriented relevance, conversely, is subjective and posits that relevance is a quality not inherent to the source; rather, it is relational and subjective and is a human judgment subject to change. For example, judgments may change over time or in relation to the cognitive state of the user. Relevance is multidimensional, and there are multiple manifestations of user-oriented relevance, including – but not limited to – topical relevance, or aboutness; cognitive relevance, or novelty and informativeness; situational relevance, or the utility and usefulness of information; motivational relevance, or the affective dimension of relevance; and socio-cognitive relevance, which takes multiple actors and their individual subjective relevance assessments into account. These manifestations of relevance interact with one another and are interdependent (Saracevic, 1997).

Source selection. Relevance and source selection are related but not synonymous (e.g. Savolainen and Kari, 2004). Source preferences are judged earlier in the seeking process than relevance; often, relevance assessment occurs when people attempt to determine the potential for information use (Savolainen, 2008). Generally, people prefer to get information from other people (e.g. Allen, 1984; Sonnenwald, 1999) rather than consulting information systems, documents, or data. The majority of the research on source selection is workplace based and focuses on organizational communication, collaborative problem solving, and trust (van den Boer *et al.*, 2016; Fidel and Green, 2004; Hertzum, 2002; Marton and Choo, 2002; Woudstra *et al.*, 2012; Zimmer *et al.*, 2007). There is also a growing body of literature that addresses source selection in informal, everyday information seeking (Agosto and Hughes-Hassell, 2006; Hartel, 2006; Savolainen, 2008, 2010) using the concept of information horizons (Sonnenwald and Wildemuth, 2001).

Research on interpersonal source selection, however, focuses less on relevance judgments than on a set of other qualities used to evaluate interpersonal sources, such as accessibility and quality and the interaction between the two. Accessibility is often posited as a key factor in human source selection, and is invoked alongside the principle of least effort (Zipf, 1949). In fact, early research in this area argued that source accessibility is the only criterion people use when selecting human sources (Gerstberger and Allen, 1968), something that many later studies refute (Fidel and Green, 2004; Marton and Choo, 2002; Woudstra *et al.*, 2012). Quality is also a factor in interpersonal source selection. Quality, which can be likened to situational relevance, is often defined as value or usefulness, and is typically a characteristic that is inferred using heuristics (Zimmer *et al.*, 2007). According to Woudstra *et al.* (2012), relevance (usefulness) and reliability (source credibility) are the two components of quality assessment; however, as previously mentioned, usefulness is only one facet of relevance, because usefulness is synonymous with situational relevance, not with relevance more broadly.

Multiple studies have examined the interaction between accessibility and quality in human source selection. According to Woudstra *et al.* (2012, 2015), the concept of social capital is a helpful framework for examining both accessibility and quality; it is also useful in understanding interpersonal source selection. Social capital, which stresses the importance of personal relationships in communities, has interrelated structural, cognitive, and relational dimensions (Nahapiet and Ghoshal, 1998). The structural component of social capital refers to the role that space and time play in shaping interactions within social networks, including network characteristics like social ties, network density, and the hierarchy of relationships among actors. The cognitive component of social capital comprises shared language and culture. The relational component refers to characteristics of the personal relationships between individuals within a network: trust, comfort, reliability, and shared norms. According to Woudstra *et al.* (2012), each dimension of social capital has its own impact on source selection criteria. These dimensions will structure the discussion of this study's results.

Social worlds

As mentioned, much of the research on source selection and knowledge transfer has been carried out in the field of organizational communication, which focuses on traditional institutions, organizations, and firms. However, informal organizations, such as social worlds, small worlds, and information grounds, also facilitate knowledge transfer. Social worlds, for example, are informal yet recognizable groups comprised of actors, events, and practices that center around a primary activity or interest, and in which knowledge transfer can play a large role (Strauss, 1978; Unruh, 1979). People can enter social worlds voluntarily and at their discretion; they can be only partially involved in social worlds, and are nearly always members of multiple social worlds (Unruh, 1980). Social worlds are based on communication: discourse, not territory, is the glue that holds social worlds together (Shibutani, 1955).

Small worlds are a particular type of social world investigated in Chatman's life-long empirical research into information behavior. Chatman's (1991a, b, 1996, 1999) work, carried out with populations such as retirees, janitors, people living in poverty, and prisoners, demonstrates how "small worlds" are developed and maintained through community norms and conventions. These norms and conventions shape and are shaped by the information behaviors among those groups; in these worlds, information is an interpersonal performance that helps to define insiders and outsiders (Chatman, 1999) through normative behaviors (Chatman, 2000; Pendleton and Chatman, 1998). Closely related to small worlds and the theory of normative behavior are information grounds (Pettigrew, 1997, 1999) which also center around communication and discourse that occurs in a particular place at a given point in time. Information grounds emerge out of the social atmosphere created when people gather to perform an activity or task; in these spaces, social interaction is the primary activity, and information flow is a by-product of that activity (Fisher *et al.*, 2007). Both of these frameworks stress the importance of space, time, and social interaction in interpersonal information behaviors (Savolainen, 2009). However, their applicability to online spaces has not yet been explored in depth. OSGs distort both time and space, which likely impacts information behaviors – especially given the importance of time and space in frameworks like information grounds and small worlds.

Some discussions of social worlds, small worlds, and information grounds address the concept of relevance; however, most examine relevance at the macro-level – how people determine which social worlds might be relevant for them – rather than the micro-level, or the relevance interactions within worlds. For example, Unruh (1979) argues that social worlds broadcast their relevance to potential participants, and describes the four types of actors in social worlds: strangers, tourists, regulars, and insiders. Strangers are detached and indifferent to a given social world; tourists engage out of a desire for entertainment and curiosity, and are often transient; regulars habitually participate in the world and are

integrated into the world and familiar to other regulars; and insiders are intimately involved with the existence of the social world, controlling, shaping, and creating it. Each social type makes macro-level relevance assessments about any given social world, and social worlds create stratified layers of relevance about themselves: “like concentric circles which move from a nucleus of intimate knowledge out to [...] knowledge of acquaintance and eventually knowledge about a social world” (Unruh, 1979, p. 123). Insiders and outsiders are also central to small worlds and the theory of normative behavior (Chatman, 2000).

However, there are few discussions in the literature of micro-level relevance assessments, which occur when people decide to communicate with other participants in the social world. Although Strauss (1978) asks in his foundational work on the topic, “who decides [...] which members are more authentic, and via what social mechanisms?”, he does not explore this idea further, nor do subsequent researchers. Likewise, Burnett *et al.* (2001) note that “[within any given small world, people] may believe that [...] information comes from an unacceptable social type, and thus conclude that the information, even if it is accurate, is itself unacceptable” (p. 538). However, their subsequent discussion does not address relevance assessment as it relates to social type in any detail. Furthermore, these frameworks rely on co-presence and are bound by both space and time. In an increasingly networked society, social networks behave like social operating systems; this distorts both space and time, impacting the information behaviors that occur within those social networks (Rainie and Wellman, 2012). For example, the rise of networked individualism may change the way that people make assessments about social worlds, given the increasing importance of the role of the individual within social networks in virtual environments.

Social worlds offer a capacity for creating and sharing knowledge that is distinct from (and has an advantage over) information and knowledge exchanged in more formal institutions (Nahapiet and Ghoshal, 1998). However, small worlds can also be formed by groups of care providers within the larger organizational context of healthcare, creating boundaries that hinder information behaviors within integrated care groups (Känsäkoski and Huotari, 2016). However, information is often exchanged asymmetrically between doctors and patients during medical appointments, with providers receiving more information than patients (McNeilis, 2001). Although patients generally prefer to get health information from providers, they often seek out health information online to supplement or to verify the information they receive from their providers (Volkman *et al.*, 2014). And patients also seek online the information that providers “can’t or won’t tell” them – often experiential information (Costello, 2016), although the transfer of experiential knowledge is as integral to formal organizations’ function as it is social worlds’ (Nonaka and Takeuchi, 1995).

While the concepts of social capital, social worlds, and small worlds have been employed as a framework in several examinations of social networks, they are often not used to describe online communities. Furthermore, these concepts have not been applied to questions of human source selection in the context of health information-seeking behavior. These frameworks can shed light on two related questions about these activities:

- (1) How do people select OSGs to visit and make comments in?
- (2) How do people determine the relevance of information provided by other patients in these OSGs?

Methods

The data presented in this paper were gathered as part of a two-year constructivist grounded theory study. In grounded theory, the data drive the researcher to ask analytic questions about the causes, interactions, and consequences of the phenomenon under examination (Charmaz, 2014). Through qualitative coding and constant comparison of data

and analysis, a theory emerges as a product of interaction between the researcher and the data. Theory is not discovered in the data; instead, it is an outcome of the “dialogue” (Dey, 1999, p. 6) between the researcher and the data.

In this study, data originate from two main sources: interviews with patients who use OSGs for CKD, and the posts they have made to three different OSGs. In total, 12 participants between the age of 25 and 70 and diagnosed with CKD were recruited using public messages posted by the researcher on four OSGs. Each participant was interviewed twice, for a total of 24 interviews that each lasted 100 minutes on average. The interviews resulted in 40 total hours of audio, which were transcribed by the researcher. A pseudonym was assigned to each participant at the time of transcription. With permission, selected threads containing posts made to the OSGs by 11 of the 12 participants were scraped. There are 1,847 total threads in the data set. The posts were also coded alongside the interview data. At the completion of the second interview, participants were sent a \$75 gift card as a token of appreciation for their time. Descriptive information about participants is available in Table I.

Data were analyzed qualitatively using constructivist grounded theory methods (Charmaz, 2014). In grounded theory, the researcher does not impose existing theoretical frameworks onto the data; instead, she develops and creates a general, middle-range theory from the particular examples set forth by the collected data (Morgan and Wildemuth, 2009). In this study, the researcher began by open coding, or “the process of breaking down the data into distinct units of meaning” (Goulding, 1999, p. 9). As the analysis progressed, she moved into focused coding, where the codes that have emerged thus far are synthesized and become more conceptual. The stages of grounded theory are not linear: the method calls for constant comparison of data, codes, categories, and constructs – to themselves and to one another. Glaser and Strauss (1967) call codes “properties” – the “conceptual aspect or element of a category” (p. 36). Multiple codes or properties make up categories, conceptual elements that provide a clear picture of the phenomenon being described to the reader (Dey, 1999). These categories are then synthesized into theoretical constructs.

The constant comparative method emphasizes simultaneous data collection and analysis, which is at the very core of what distinguishes grounded theory from other analysis methods (Walker and Myrick, 2006). The process allows the codes, categories, and constructs to change throughout the research process, conforming to fit the data as they are collected. Data collection and analysis process are tracked using memos describing the emerging codes, categories, and constructs. A variety of techniques to write memos were used in the present study, including clustering, analytic memoing, and free-writing.

| Pseudonym | Recent treatment | Number years on OSG | Number posts on OSG (approximate) |
|-----------|---|---------------------|-----------------------------------|
| Joan | Transplant (deceased donor) | 8 | 8,500 |
| Nina | Transplant (living donor) | 4 | 200 |
| Brent | Home hemodialysis | 3 | 300 |
| Amy | Fistula placed for in-center hemodialysis | 4.5 | 0 (lurker) |
| Steve | Fistula placed for in-center hemodialysis | 5.5 | 4,500 |
| Travis | In-center hemodialysis | 3.5 | 80 |
| Gretchen | Peritoneal dialysis | 4 | 1,000 |
| Sherri | Recently diagnosed | 1 | na |
| Candice | Recently diagnosed | < 1 | 5 |
| Jacob | In-center hemodialysis | 4.5 | 300 |
| Laura | Peritoneal dialysis | < 1 | 10 |
| Robert | In-center hemodialysis | 4.5 | 930 |

Table I.
Participants’
information, listed by
date of first interview

The memoing process and the constant comparative method lead directly to theoretical sampling, because they allow the identification of categorical gaps that theoretical sampling will then systematically address.

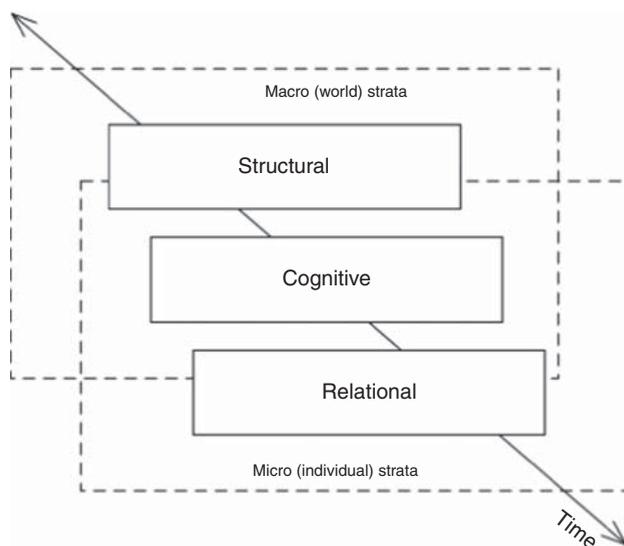
Theoretical sampling is the process by which the researcher chooses data sources with a focus on the existing categories and constructs, and it advances the creation of robust categories and constructs. It is distinguished from more typical forms of sampling, which are based on the identification of the population or populations of interest before the research begins (Draucker *et al.*, 2007). As Glaser and Strauss (1967) explain, “Our [sampling] criteria are those of *theoretical purpose and relevance* – not of structural circumstance” (p. 48, emphasis in original). Therefore, the sample need not be traditionally representative. In the present study, theoretical sampling began after the sixth participant had been interviewed; the interview guides were adapted to probe specific questions about the social structure of OSGs. Recruitment was also focused on participants who were relatively new to using the OSGs in question, as well as participants who had stopped writing content but who were still readers, as the ongoing analysis indicated that these strategies would add richness to the existing analysis.

Generating the core concepts of the theory by way of integrating codes and categories has been described as an art form (Strauss and Corbin, 1990), and relatively few guidelines for carrying out the process exist (Boeije, 2002). In this study, memoing was used to track the research process as data collection and analysis progressed and the open codes were grouped into categories, which were then grouped into the theoretical constructs presented in this paper. The codes, categories, and constructs were also compared with existing theoretical frameworks after theoretical sampling began; this technique is common in grounded theory research (Zhang and Wildemuth, 2009). Two existing theories relevant to the current study were examined in detail in order to build this theoretical framework: Unruh’s (1979) theory of social worlds, and Saracevic’s (1996) stratified model of relevance assessment. There are four criteria for trustworthiness in naturalistic, interpretive studies: credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985). The analysis in the present study was verified using data triangulation, member checking, and peer debriefing.

Results

Building on Unruh’s (1979) claim that social worlds create stratified layers of relevance about themselves and on Saracevic’s (1996) stratified model of relevance assessment, this section presents a model of stratified relevance assessments made about social worlds; this model is based on the framework of social capital and its relationship to human source selection, as presented in Table I (Woudstra *et al.*, 2012). The model addresses two strata of social relevance assessments: a macro- and a micro-level stratum. The macro-level stratum operates at the social world level, and occurs when people who are outside of the world – strangers and tourists – assess that world for relevance to their own health information or support needs. The micro-level stratum operates at the individual level, and occurs when people who are tourists, regulars, or insiders assess other people who are in the world as individual sources of health information and social support. These relevance assessments are interrelated and made over time, and they operate along three dimensions: structural, cognitive, and relational. A model of these assessments is presented in Figure 1.

This section discusses how participants assess both the social world of OSGs and individuals within those worlds. First, assessments of the structural dimensions of the social world are discussed. Next, some of the cognitive assessments that participants make of the social world and individuals in that world are presented. Finally, the relational assessments that participants make to evaluate information shared by individual members of the OSGs are explicated. This final section also introduces the concept of similarity assessment, a central activity for both information seeking and personal health information disclosure on the forums.



Social
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Figure 1.
Relevance strata in
social worlds

Structural assessments

Structural assessments are assessments of social worlds made at a macro-level by strangers and tourists as they encounter social worlds – in this case, OSGs related to CKD – and determine whether or not they are relevant. Structural components deal with both time and space, and in the context of this study they are mostly in play when participants first encounter OSGs and how they decide to fold them into their regular internet routines.

Finding the OSG. Participants began searching for general information about CKD online; they did not set out to find other patients who shared their diagnosis. They encountered the social worlds of OSGs by conducting exploratory searches for general information about kidney disease. These serendipitous encounters are particularly interesting; although participants say they feel at times as if they are informationally and emotionally unsupported by their healthcare providers or family, this lack of support does not translate directly to searching for fellow patients to fill the support gap. Instead, it creates a need that goes unmet until they “run across [the OSGs] [...] just when looking stuff up,” as Amy puts it. Serendipity is a central theme in people’s interactions with OSGs: both the posts in the Introduction forum and the interview data suggest that it is incredibly rare for people to specifically seek out groups of similar patients. When participants do encounter these spaces, they describe becoming “hooked” or “obsessed” with the group. Take Steve, for example:

I got hooked, like, immediately, on it. Because I would say, “I have a question,” and these people were like, “Oh, yeah, that happened to me! Ask this, and this, and this.” And I would go in and I would ask those three questions, and those were exactly the questions that I needed to ask.

Steve describes getting “hooked immediately” because the group was active and provided him with information that he was able to use during clinical encounters.

Activity level in OSGs. How frequently participants visit individual OSGs is closely related to how active the OSGs are. Nina, for example, says that she decided to start participating in the forum she chose, over “a few” others that she “liked,” because this one “had the most traffic. Every day, there’s people posting. Every day. Every day. And I didn’t find any other kidney-oriented site that had the kind of traffic that [they] had.” Robert says

he visits one forum on a daily basis because, as he says, “there’s a lot more of a conversation on there.” The activity level is an oft-repeated reason for returning to specific forums more frequently than others – forums with more activity are visited more often. Forum activity is affected by the vagaries of search rank and by interfaces; OSGs with explicit community-building elements designed into the interface (notifications, introduction threads, off-topic chat boards, etc.) tend to be more active. And the less-active forums are not able to build the social capital to fully create a relevant social world; participants from less-active forums report feeling a lack of community in their OSGs, because a sense of community is fostered by member interaction (Maloney-Krichmar and Preece, 2005). This is related to two structural dimensions of social capital that impact source selection criteria: accessibility and time. Brent says that the lack of community on his less-active forum is partially because of interface problems:

[Y]ou can respond or put a question out there and you have to constantly go back to see if anybody answered it. There’s no way to automatically know that somebody followed up on one of your posts [...]. And with the difficulties searching, you might never see it. And if you do find it, it’s like, oh yeah, that was three months ago [...]. You really don’t know [if anyone reads your message].

Accessibility and time are also important structural factors in defining both small worlds and information grounds (Savolainen, 2009); it is evident that the amount of activity in an OSG combined with the interface design both contribute greatly to the structural relevance assessments participants make when they first encounter a particular OSG.

Cognitive assessments

Identification of groups or communities is often based in an apparent similarity: the group is seen to be a homogeneous collection of people who are members of the same social category (Ren *et al.*, 2012). Groups that are perceived to be homogeneous foster the assimilation of other, similar individuals (Pickett and Brewer, 2001). Candice, who feels that the forum she frequents is not a community, feels this not only because of lack of activity, but also because the people there are not like her: in fact, similarity to other users is one of the most important relevance assessments people make when exchanging information on OSGs – both when they seek it out and when they choose to share or disclose. While similarity is important in all levels of assessment – structural, cognitive, and relational – and is touched on in each of these subsections, the most detailed discussion of similarity and how similarity is assessed is relational, not structural or cognitive.

Lurking. Participants describe “lurking,” or reading the forums without commenting for some time before posting. This is the tourist phase of information gathering: participants cognitively assess the social world to determine its potential value. Steve says that he looked at the forums for an entire day after he found them; he then registered and made his first post that evening. Gretchen, conversely, read the forums daily for about a month before joining, until she had consumed all of the available content. Sherri says: “I’m going to have to cop and say I haven’t [asked questions online]. I’ve been feeling like I’m ready to. What you do etiquette-wise is you lurk and you find out what are the rules in this social group.” Sherri’s lurking gives her time to make cognitive assessments of the relevance of the social world, as she learns the shared language and culture of both CKD patients and of the specific OSG.

Lurking is common in online forums for a variety of reasons, and other studies corroborate Sherri’s expressed desire to understand forum norms before “de-lurking” and starting to participate (Preece *et al.*, 2004). Lurking is related to both the structural and cognitive components of social capital. While Preece *et al.* found that people who lurk are less satisfied with their experiences in forums than people who contribute more actively, this study offers contradictory evidence. For example, Amy has never commented, but she

explains through tears that “reading other people’s stuff is so therapeutic for me [...]. It just hits me, how lucky I am.” Audibly crying, she continues: “It gives me a different perspective on my life. And through that process of seeing someone else’s experience I can see my own experience differently.” In fact, Amy says that she does not post because she finds writing to be overwhelming. In Amy’s case, the emotional impact of disclosure means that she decides only to lurk, yet still feels connected to the social world of the OSG. Lurking allows for the transition from “outsider” to “insider,” and it is an essential part of becoming familiar with the social norms of the community, including understanding shared language, acceptable topics, and tone (Burnett *et al.*, 2001).

People also lurk because they do not want to repeat questions that other users have asked. As Nina says in one of her first forum posts, “I want to try and read as much as I can before I ask something that is already answered in all the many posts [here].” Lurking thus serves several functions: it allows users to gain an understanding of what questions are asked, what information people disclose and share, what the general rules and norms are in the forum, and how much activity occurs – all qualities that influence whether the forum serves as a cohesive community. Lurking is part of a structural and cognitive assessment made by potential participants of the social worlds of individual OSGs.

Relational assessments

Participants repeatedly bring up the desire to find similar people to get information from and to share information with in OSGs. This is not particularly surprising – one of the largest social networks for chronic illness, PatientsLikeMe, is named after this desire for similarity, and it is generally accepted that “people like others who are similar to them in preferences, attitudes, and values, and they are likely to work or interact with similar others” (Ren *et al.*, 2007). Users thus conduct similarity assessments, and these similarity assessments affect how users assess social relevance (at both the micro- and macro-levels), how they assess other users’ credibility, and what and how much they disclose within OSGs. Similarity assessment is an example of a relational assessment of source selection.

Facets of similarity assessment. Interpersonal similarity is a multi-dimensional concept (Lydon *et al.*, 1988); participants describe several indicators that they use to assess similarity with other users. Suitor *et al.* (1995) classify these similarity indicators as either “structural” or “experiential” similarities. Structural similarities (not to be confused with the macro-level structural assessments carried out on potential social worlds by strangers and tourists) are typically demographic similarities, like geographic location or age. Multiple participants mention finding other users from the same geographic location, although they do not tend to share information about which doctors from their area to visit, or what dialysis centers they prefer, with other local people. Instead, geographic similarity contributes to the sense of community, and it is often mentioned when participants greet new users in the Introduction sub-forums. Participants also value age similarity. Laura, who is in her 20s, says that age similarity is particularly important to her: “I felt very alone when this whole process started because I never saw anyone my age that was going through this. Never came across anyone at the hospital [...]. They were an older age group.”

Experiential similarity. Structural similarity, although it is present, is less important in participants’ similarity assessments than experiential similarity – shared similar experiences with other users. This is often framed in terms of similarity in disease stage. Participants typically seek out users who are at the same or a later stage of the disease trajectory, ignoring users at earlier stages. Travis says, “Some of them say, ‘Oh my gosh, I’m at Stage II, I’m just going to lie down and wait to die,’ and I’m going, ‘Stage II? Stage II? You should be thankful you’re there!’” It is especially important for participants to get information from users farther along the disease trajectory – information that Gretchen characterizes as “relevant [...]

because I could see other people's problems, I wasn't having that problem yet, but I was aware of it and could keep an eye open for it." This finding confirms the findings of Suito *et al.* (1995), who show that, when people search for social support during stressful times of transition, structural similarity is less important than experiential similarity.

Sometimes the idea of similarity is very broad – a shared CKD diagnosis was enough for Travis, and this is especially true for newly diagnosed patients whose diagnoses were unexpected. Take Steve, for example, who says that reading about shared experiences was integral for his care from the very start. Having a shared diagnosis makes Steve trust the information provided by other users: "I know that I should be asking my doctors these questions," he says in an early post on the forums, "But I believe that I would get a much more straight forward answer from [this] community." And Nina says that there is information that the doctors "can't or won't tell you." When talking about her first kidney biopsy, she says, "My doctor said, 'Oh, they're not that bad,' and I had to just bite my tongue, because I wanted to say, 'When did you have your last kidney biopsy?' I mean, you know? If you go to a [forum], there's somebody who has actually gone through this." In other words, although her doctors are medical experts, they have no experiential similarity with CKD patients; lacking the emotional and physical experience of the disease and treatment, the information they offer is incomplete. Experiential similarity makes other users' accounts of their lived experiences highly relevant for Nina, and these accounts supplement information provided by her doctors. In fact, previous research suggests that one major motivator for frequenting patient OSGs is to supplement information from providers (e.g. Rubenstein, 2012).

This may be particularly true when participants have questions about emotion. As Robert explains, CKD can be full of what he calls indignities, and sharing the experience of indignity is, for him, an important component of similarity: "I'm in my dialysis center, and there are 38 chairs, and I think, 'This is humiliating. It's a warehouse.' Dialysis is either prolonging life or prolonging death, depending on how you're being treated. That's the indignity. And you can't understand that – you *can't* – unless you go through it" (emphasis in original). Here, Robert discusses both physical and emotional components of dialysis, and notes that both components must be experienced to be understood. As Laura points out that, not only does her medical team not understand her emotional needs and values, they dismiss them:

I remember speaking to my renal team and saying, this is December, I said, "I have a Christmas party coming up. What am I going to wear? Am I going to be able to hide this?" The one woman, she was giggling, and she said, "Why on Earth would you ask that question? Is that your biggest concern right now?" I just thought, well, yeah, it is. It may sound silly to her, that she thinks that I worry about physical appearance, but you do when you're 28, and have your Christmas party, and you wanted to wear this dress but you can't, because it's fitted around the stomach. To someone else, it might seem like the most ridiculous concern, but to you, it can be a major thing. Only someone that is similar to you in that situation can really sympathize with that type of concern.

Here, Laura is looking for a similarity of values: she values exercising, socializing, working full-time, and taking pride in her appearance, and these are factors in her similarity assessments because similarities allow her to make comparisons and to hope for a future in which she is able to maintain her pre-diagnosis identity.

Shared values. Shared values are thus another central measure of relevance; when choosing a dialysis modality, participants may look for people who share their values because, as Joan says, "Choosing your dialysis modality is really a lifestyle choice" – an observation that is corroborated by the literature (Winterbottom *et al.*, 2012). Different modalities allow for different activities: swimming is difficult on peritoneal dialysis, traveling is more difficult (but not impossible) if one is treated in a center, and someone who lives alone cannot administer home hemodialysis. These aspects of everyday life, and of lifestyle, impact health choices and also impact how similarity is assessed. Travis, who

deeply values camping and hiking, was concerned about choosing a dialysis modality that allowed him to continue these activities. On the forums, he told another patient, who also enjoyed camping, that he was considering hemodialysis:

He went, “Yeah, you’re probably making the right decision for you. The way you are, and what you like to do, hemodialysis is probably the best,” which kind of made me feel good, too. That was coming from somebody who was removed from my story. He didn’t have, as they say, a horse in the race, but it was coming from somebody I respected and who I thought I could trust.

Shared values are similar to the concept of a worldview from the theory of normative behavior, a collective perception within a small world of what is important and what is not (Chatman, 2000). Interestingly, the topics that help participants determine shared values within OSGs in this study are not necessarily topically relevant to the small world of the OSGs. Hobbies, political leaning, and religion were all routinely used to assess shared values, and not all members of the individual OSGs share a similar worldview as might be expected from the theory of normative behavior. This may be because the heuristics for assessing worldview are different online, where factors like race, gender, and age are less visible and are therefore less easy to use as heuristics.

Methods of assessing similarity

To identify structural and experiential similarities, participants report reading various posters’ comment history (a feature that is available on all of the OSGs, but often only to registered users), monitoring the board’s introduction posts for people who have similar stories, and reading signature lines on individual comments.

Signature lines. Signature lines are one very useful method of assessing similarity. The user practice of providing “signatures” – what this researcher has dubbed illness vitae for their structural similarity to curriculum vitae – often offers a concise history of the poster’s diagnosis, illness trajectory, and treatment choices (e.g. Fistula – March 2008; Started dialysis – July 2008; New fistula – June 2011).

As Steve explains, evaluating comments for relevance without context takes a lot of time and effort: “I don’t have diabetes. I don’t have lupus. I don’t have PKD. The reason behind the loss of [those people’s] kidney function isn’t pertinent to me. Weeding through all that was [...] it took a long time.” Participants use signatures to help them evaluate the likely relevance of a particular poster’s information; in the OSGs examined that facilitate this practice, signatures, which are automatically appended to each comment, nearly always included bulleted, dated lists of the most important events in the user’s illness trajectory. Amy describes using these lists as a way to quickly identify posts to read in depth and posts to ignore: “As I’m reading, I’ll glance down and think, ‘That’s not worth even trying to read in depth.’” The vita provides important contextual information for every comment a particular user makes.

The signature line acts as a similarity badge for users, allowing quick assessments of the potential relevance of the content of specific comments to their own situation. These signatures tend to be dated and are fairly standardized: the date of diagnosis is always included, as are other important events like the date a fistula was placed, the date dialysis was started, and/or the date of any transplants. In previous research, signatures have been seen as heuristics for evaluating credibility in OSGs (Metzger *et al.*, 2010). The present study extends this understanding, underscoring the emotional component of assessing similarity: reading the vitae provides participants with the feeling that other users will provide credible information based on structural and experiential similarities.

Introduction sub-forums. Travis explains how the OSG that he uses fosters similarity assessment: it requires that users create an Introduction post – a short paragraph or two outlining their experiences with CKD thus far, and their reasons for joining the forum. These

posts allow people to make simultaneous cognitive assessments of the shared language and culture of other users and relational assessments of relevance, and, says Travis, they foster community through similarity:

We're all in this together and we can help each other. And so that first post, to have that many people respond to you, I suppose I felt, "Wow, this really is a community type place, and everybody's here with the same issues."

Although most participants' OSGs have "Introduction" sub-forums, not all do. Both Laura and Candice visit forums without a dedicated space for introductions, and, as noted earlier, both women do not feel like the OSGs that they frequent are communities. This illustrates the overlap between relational and cognitive assessments of social worlds. For example, Candice, who frequents a very low-activity forum for CKD, says that she does not feel like she is part of a community, in part because of the forum's low activity, and in part because she is not able to find people who share her specific health issues:

I can't find anyone there who has the same problems I have. And most people seem to come on once and then never come back [...]. So no, there is not a real sense of community for me, and I can't get what information I need from the people that are there because they do not have the same problems that I am having.

Interaction of relevance assessments. Here, Candice discusses how similarity assessment interacts with and influences the assessment of information provided by other people. Similarity assessments of all kinds can "leak" into cognitive assessments of information's relevance. Indeed, some participants actively distrust and avoid comments from other users whom they perceive as holding values and beliefs that are dissimilar to their own. For example, Amy says that she tends to ignore specific people because they do not share the same values around the importance of science and factual evidence:

I ignore people just because, well, based on what they always post. It doesn't always seem to be general practice medicine type answers. It's like almost opinionated more than factual. And I'm more really into the people that can back up what they're saying by medical stuff. Or seems they've done their own research enough to know that it is legitimate.

When asked how she is able to differentiate "opinionated" information from "factual" information, she says:

I guess, the amount of detail they go into it and not going off onto into [...] [information] outside the medical. To be honest with you, my daughter's getting married and her husband believes in this holistic stuff and he doesn't believe in a whole lot of stuff that I am doing medically. He kind of thinks I'm overboard medical-wise, and he thinks you can go out and take this herb and it will cure everything. And that's the kind of thing I try to stay away from.

Amy assesses the cognitive relevance of people's factual contributions in part based on relational criteria: her assessment of her belief similarity with the information source. When asked why she tries to "stay away from 'opinionated'" information, she replies: "It just doesn't go along with my beliefs. I have a high regard to the medical people. I don't necessarily know they're always right, but I trust them."

One way that participants assess belief similarity is by using political affiliation as a heuristic. For example, Gretchen describes a vocal user on the forums who has opposing political beliefs to hers:

When he gets into talking medical stuff, he's really, really useful, helpful, whatever it is but when he's talking politics, he's unbelievable. It's almost as though it's a neighbor or a friend or someone like that. You get to know what their strengths and weaknesses are I suppose.

Again, we see that cognitive relevance is linked with relational relevance; here, Gretchen praises the factual information this user supplies, but does not consider him similar to her in belief. Not all users are able to separate the two domains so easily. Emotional dissimilarity can color cognitive assessments. The political sub-forums on one of the OSGs studied are heavily trafficked and emotionally charged. Although they are located in the “Off-topic” sub-forums, multiple participants brought up issues and arguments stemming from political debates. Several participants say that political arguments influence their participation on other parts of the site; in three cases, participants left the site for long periods of time – some indefinitely – stemming from heated discussions and arguments about politics. Political beliefs – as in, whether one aligns with a typically liberal or conservative viewpoint on a given political issue – on this particular sub-forum play a large role in the construction of the OSG as a social world; however, they also may make some people feel unwelcome in the OSG because of political dissimilarities. This feeling may make some less willing to participate in the on-topic areas of the site or less willing to disclose information about their own health, demonstrating the importance of a shared worldview to participants (Chatman, 2000). One participant no longer visits his “main” OSG due to a political dispute with another user, but he is still active on other OSGs. He reports “missing” his main OSG and hopes that the political conflict with this other user might fade over time so that he might return. Another participant had a dispute over politics with one of the moderators in one of the OSGs and no longer makes comments there; in her last post, she said that she no longer feels “safe” disclosing personal information. She still visits the forum regularly to read, although she no longer contributes. Some OSG participants, then, use similarity and dissimilarity, especially in the area of values and beliefs, as a heuristic for trust.

Similarity is thus not only about assessing information’s relevance, but about trust, emotion, and credibility. Similar individuals can provide a combination of informational and emotional support, as seen in a comment from Nina, who says:

If you read [the forum] as I read it, regularly, these people who post all the time? You kind of get an idea of the people that when they’re posting, I pay more attention to. Because I feel they’re better thought out and they are just, they have more credibility, I guess, but also more compassion.

Here, Nina outlines the emotional component of credibility assessment in health information behavior in OSGs. Participants in OSGs are seeking out socially relevant information – information that encompasses both the credible and the compassionate, highlighting the intersection of emotion and cognition when social relevance assessments are made.

Similarity assessments and disclosure

Socially relevant information – information that is both emotionally and cognitively relevant and whose relevance is often based on similarity assessments – helps people decide whether to trust information from other posters, and whether to disclose personal health information within OSGs. A sense of dissimilarity between posters – which often increases after a transplant – may change disclosure habits. Take Joan, for example, whose posting decreased significantly after she received a pre-emptive transplant. She says that this is because she was no longer similar to most of the people on the forums:

I’m very conscious of the people who either have had a transplant, and are not doing so well or who are waiting for a transplant. So I’m very aware of not wanting to appear prideful or negligent emotionally of all of these other people. Basically, I don’t want to brag.

For Joan, the new lack of similarity between her and other posters means she discloses less online. By sharing little about her transplant, Joan avoids downward comparison. Conversely, Nina's participation increased substantially after she received her transplant; she describes that she refrained from disclosing much information before her transplant because, as she says:

I [didn't] feel so much like I have that much to give, because [...] there does seem to be a steady influx of people who do have a lot of experience and there are people who have been on for a long time who know a lot of stuff, what's going on.

Her posting activity went up considerably the month of her transplant, and she continues to post more than she did before her transplant. The differences between Joan and Nina's online disclosure habits after their transplants illustrate that the lack of similarity with other OSG users affects different people differently – and these are OSG members that stayed after their transplants, which, according to Robert, is rare; most move on.

Similarity assessments, therefore, often shape what information people decide to disclose and how that information is relayed. Disclosure may be related to similarity assessments because similarity produces a strong feeling of group attachment, which is furthered by feelings of belonging and of being similar to other people in the group (Smith *et al.*, 1999). This phenomenon also occurs in formal organizations; people who share similarities interact with one another more, which in turn fosters more sharing within homogenous groups (Makela *et al.*, 2007). Therefore, relevance is assessed not only when participants seek out information, but also when they choose what to disclose. Homogeneity in in-person groups differs from homogeneity online: this is why experiential similarity is so important to participants, while demographic similarity is not as important. This can be seen in Brent's comments; he identifies himself as an advocate who does not seek information, but shares it. In fact, he calls himself a sharer, and his purpose on the forums is to relay information to other people. Brent strives to make the information he discloses about himself and the information he shares about CKD broadly applicable so that it is relevant to many users:

In the forums I try to be more general, try to have a broader focus, rather than a narrower focus. That's the best way I can explain it. So when I respond in a forum I try to think about more than just the individual who is asking the question. Take into consideration other individuals [...] to make my answers applicable to more readers, to a broader group.

This illustrates the overlap between cognitive and relational assessments of the social world of OSGs: disclosure decisions made based on similarity assessments apply to the assessment of shared experience with other users, which is both a cognitive and relational assessment.

But participants seem very aware that similarity is not identity, and are careful to keep similarity assessments from coloring their cognitive assessments of relevance. Participants stress the individuality of experience, and the fact that the information they are sharing is subjective, when they disclose personal health information and give advice on the forums. Brent says, "I have to qualify my situation all the time so that people aren't misled and think that they can do what I do. Because generally they can't. But other aspects are more general." Brent emphasizes the limits of similarity by saying things like "I'm a testament to the variation of the individual responses to hemodialysis" in forum comments. Nina, too, explains that, although people similar to her may have had experiences that are predictive of hers, "that doesn't mean that your experience is going to be the same. But that is someone who went through it [...]. And I guess that's the danger of it." Joan says, "You hear other people's stories, but that's all they are. Stories." In other words, participants are careful not to let similarity blind them to difference, and not to let emotional measures remove their ability to assess information cognitively; participants are aware that individual

experiences are not facts. Assessing similarity, therefore, allows individuals to predict the relevance of experiential information shared by others in a context where multiple personal factors play a prominent role.

Discussion

The importance of similarity in this study, and perhaps in relevance assessments made in other virtual worlds, is likely related to the fact that these interactions occur online. Traditionally, social worlds, small worlds, and information grounds are spatially and temporally bound, and the information behaviors that occur within them are both afforded and constrained by space and time (Savolainen, 2009). Physical spaces, the features of those places that allow for face-to-face conversations, co-presence of people, and the physical proximity of those other people are essential in both frameworks. Additionally, they are both temporally sensitive: the emergence and dissolution of information grounds are facilitated by time (Pettigrew, 1997). Small worlds generally have limited time horizons and focus on the present (Chatman, 1991b). In the era of networked individualism, people have shifted their focus from a “little boxes,” neighborhood-oriented world to an environment that connects individuals through information communication technologies (ICTs) much like a social operating system (Rainie and Wellman, 2012). ICTs distort both space and time: geography becomes compressed, while time lengthens (Hassan, 2007). Therefore, some of the key constructs in small worlds and information grounds are fundamentally changed in a networked world. However, the constructs of the small world and of information grounds are not obsolete in a networked environment, as some have suggested (Savolainen, 2009). Rather, they can and should be adapted. For example, physical spaces, now interfaces, allow for structural relevance assessments of OSGs; however, these structural relevance assessments become less important over time as participants become integrated into specific OSGs through their assessments of cognitive and relational relevance. The practice of lurking, which allows for cognitive relevance assessments, extends and elucidates Chatman’s notion of social types. And finally, social norms like shared language and other social factors become increasingly important and allow for relational assessments of relevance online. In the context of this study, networked individualism becomes a key construct through which people identify social sources of information. The importance of the individual within networked individualism may be what causes similarity to be such a vital factor in relevance assessments in OSGs.

There are some limitations to address. First, the sampling strategies used in this study are not representative, nor are they intended to be. This is standard practice for grounded theory research (e.g. Charmaz, 2014). In this study, participants responded to recruitment messages posted online, mostly to OSGs for patients with CKD, and were therefore self-selected. The sample therefore necessarily includes only individuals who were willing and able to talk about their experiences with CKD and who were comfortable with using the internet for health information. It therefore may not include the large portion of individuals diagnosed with CKD who have low health literacy (Devraj *et al.*, 2015; Fraser *et al.*, 2013) and who do not have access to the internet (Schatell *et al.*, 2006). Demographic data, such as race and exact age, were not collected from participants. Additionally, the sampling methods used to select comments made to the OSGs are necessarily purposive and do not include all of the comments made by all participants. This is because some of the participants were highly prolific; the inclusion of all of their comments would have dominated the data set. The limitations described above can be addressed in future research that uses representative sampling strategies to test the model developed in this study.

There are many avenues for future research. While participants described many different factors of similarity, this research has not addressed the relationship between and among these factors. Future exploratory studies examining the different factors of similarity

assessment that are evaluated when people search the social web are necessary in order to determine what factors matter in what contexts. Another grounded theory study could aid in the operationalization of the concept, providing a useful set of constructs to be tested quantitatively in future work. Furthermore, an examination of personal beliefs and the role they play in similarity assessment is warranted, particularly given the dearth of studies examining how beliefs impact relevance judgments. A reconceptualization of the applicability of the constructs identified in both small worlds and information grounds to virtual environments is also necessary.

Conclusion

This paper presents a stratified model of social relevance assessments in OSGs. These assessments are made when people select OSGs, when they select what people to pay attention to in those OSGs, and when people decide what information to disclose about their own health. This extends our understanding of relevance, as it occurs not just when people seek out information but also when they disclose information. Individuals make three broad types of relevance assessments within the social worlds of OSGs: structural, cognitive, and relational. Structural assessments take place when participants select which OSGs to frequent; cognitive assessments take place when participants determine whether they want to become active, regular members of specific OSGs; and relational assessments occur when participants evaluate information provided by other people within the OSGs of their choosing. These assessments often overlap, and may occur simultaneously; they also occur over time.

This study presents a model of information behaviors in OSGs that should be tested for its transferability to other contexts and domains. Because the model as developed is general, it may be applicable to other OSGs for other chronic illnesses. It may also be transferable to contexts outside of health where people search for and disclose information to other people online, such as hobbyist sites or more general online social networks. Future work should assess the transferability of the stratified model of social relevance assessments and the relationship between and among its constructs in other contexts. The findings from this study therefore provide a basis for future substantive research in information science.

References

- Agosto, D.E. and Hughes-Hassell, S. (2006), "Toward a model of the everyday life information needs of urban teenagers. Part 1: theoretical model", *Journal of the American Society for Information Science and Technology*, Vol. 57 No. 10, pp. 1394-1403.
- Allen, T.J. (1984), *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within the R&D Organization*, The MIT Press, Cambridge, MA.
- Boeije, H. (2002), "A purposeful approach to the constant comparative method in the analysis of qualitative interviews", *Quality & Quantity*, Vol. 36 No. 4, pp. 391-409.
- Borlund, P. (2003), "The concept of relevance in IR", *Journal of the American Society for Information Science and Technology*, Vol. 54 No. 10, pp. 913-925.
- Burnett, G., Besant, M. and Chatman, E.A. (2001), "Small worlds: normative behavior in virtual communities and feminist bookselling", *Journal of the American Society for Information Science and Technology*, Vol. 52 No. 7, pp. 536-547.
- Charmaz, K. (2014), *Constructing Grounded Theory*, 2nd ed., Sage Publications Ltd, Thousand Oaks, CA.
- Chatman, E.A. (1991a), "Channels to a larger social world: older women staying in contact with the great society", *Library and Information Science Research*, Vol. 13 No. 3, pp. 281-300.
- Chatman, E.A. (1991b), "Life in a small world: applicability of gratification theory to information-seeking behavior", *Journal of the American Society for Information Science*, Vol. 42 No. 6, pp. 438-439.

- Chatman, E.A. (1996), "The impoverished life-world of outsiders", *Journal of the American Society for Information Science*, Vol. 47 No. 3, pp. 193-206.
- Chatman, E.A. (1999), "A theory of life in the round", *Journal of the American Society for Information Science*, Vol. 50 No. 3, pp. 207-217.
- Chatman, E.A. (2000), "Framing social life in theory and research", *The New Review of Information Behaviour Research*, Vol. 1, pp. 3-17.
- Costello, K.L. (2016), "Impact of patient-provider communication on online health information behaviors in chronic illness", *Proceedings of the 79th Annual ASIS&T Meeting, Presented at the Association for Information Science and Technology, Copenhagen, October 14-18*.
- Devraj, R., Borrego, M., Vilay, A.M., Gordon, E.J., Pailden, J. and Horowitz, B. (2015), "Relationship between health literacy and kidney function", *Nephrology*, Vol. 20 No. 5, pp. 360-367.
- Dey, I. (1999), *Grounding Grounded Theory*, Emerald Group Publishing Ltd, San Diego, CA.
- Draucker, C.B., Martsolf, D.S., Ross, R. and Rusk, T.B. (2007), "Theoretical sampling and category development in grounded theory", *Qualitative Health Research*, Vol. 17 No. 8, pp. 1137-1148.
- Fidel, R. and Green, M. (2004), "The many faces of accessibility: engineers' perception of information sources", *Information Processing & Management*, Vol. 40 No. 3, pp. 563-581.
- Fisher, K.E., Landry, C.F. and Naumer, C. (2007), "Social spaces, casual interactions, meaningful exchanges: 'information ground' characteristics based on the college student experience", *Information Research*, Vol. 12 No. 2, available at: www.informationr.net/ir/12-2/paper291.html (accessed April 25, 2016).
- Fraser, S.D., Roderick, P.J., Casey, M., Taal, M.W., Yuen, H.M. and Nutbeam, D. (2013), "Prevalence and associations of limited health literacy in chronic kidney disease: a systematic review", *Nephrology Dialysis Transplantation*, Vol. 28 No. 1, pp. 129-137.
- Gerstberger, P.G. and Allen, T.J. (1968), "Criteria used by research and development engineers in the selection of an information source", *Journal of Applied Psychology*, Vol. 52 No. 4, pp. 272-279.
- Glaser, B.G. and Strauss, A.L. (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine de Gruyter, New York: NY.
- Goulding, C. (1999), "Grounded theory: some reflections on paradigm, procedures and misconceptions", available at: <http://wlv.openrepository.com/wlv/handle/2436/11403> (accessed September 1, 2012).
- Hartel, J. (2006), "Information activities and resources in an episode of gourmet cooking", *Information Research*, Vol. 12 No. 1, available at: www.informationr.net/ir/12-1/paper282.html
- Hassan, R. (2007), *24/7: Time and Temporality in the Network Society*, Stanford University Press, Stanford, CA.
- Hertzum, M. (2002), "The importance of trust in software engineers' assessment and choice of information sources", *Information and Organization*, Vol. 12 No. 1, pp. 1-18.
- Känsäkoski, H. and Huotari, M.-L. (2016), "Applying the theory of information worlds within a health care practise in Finland", *Journal of Documentation*, Vol. 72 No. 2, pp. 321-341.
- Lincoln, Y.S. and Guba, E.G. (1985), *Naturalistic Inquiry*, 1st ed., Sage Publications Inc., Newbury Park, CA.
- Lydon, J.E., Jamieson, D.W. and Zanna, M.P. (1988), "Interpersonal similarity and the social and intellectual dimensions of first impressions", *Social Cognition*, Vol. 6 No. 4, pp. 269-286.
- McNeelis, K.S. (2001), "Analyzing communication competence in medical consultations", *Health Communication*, Vol. 13 No. 1, pp. 5-18.
- Makela, K., Kalla, H.K. and Piekari, R. (2007), "Interpersonal similarity as a driver of knowledge sharing within multinational corporations", *International Business Review*, Vol. 16 No. 1, pp. 1-22.
- Maloney-Krichmar, D. and Preece, J. (2005), "A multilevel analysis of sociability, usability, and community dynamics in an online health community", *ACM Transactions on Computer-Human Interaction*, Vol. 12 No. 2, pp. 201-232.
- Marton, C. and Choo, C.W. (2002), "A question of quality: the effect of source quality on information seeking by women in IT professions", *Proceedings of the American Society for Information Science and Technology*, Vol. 39 No. 1, pp. 140-151.

-
- Metzger, M.J., Flanagin, A.J. and Medders, R.B. (2010), "Social and heuristic approaches to credibility evaluation online", *Journal of Communication*, Vol. 60 No. 3, pp. 413-439.
- Morgan, C. and Wildemuth, B.M. (2009), "Questions related to theory", in Wildemuth, B.M. (Ed.), *Applications of Social Science Research Methods to Questions in Information and Library Science*, Libraries Unlimited, Westport, CT, pp. 40-47.
- Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and the organizational advantage", *The Academy of Management Review*, Vol. 23 No. 2, pp. 242-266.
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, NY.
- Pendleton, V.E. and Chatman, E.A. (1998), "Small world lives: implications for the public library", *Library Trends*, Vol. 46 No. 4, pp. 732-751.
- Pettigrew, K.E. (1997), "The role of community health nurses in providing information and referral to the elderly: a study based on social network theory", unpublished doctoral dissertation, The University of Western Ontario, London.
- Pettigrew, K.E. (1999), "Waiting for chiropody: contextual results from an ethnographic study of the information behaviour among attendees at community clinics", *Information Processing & Management*, Vol. 35 No. 6, pp. 801-817.
- Pickett, C.L. and Brewer, M.B. (2001), "Assimilation and differentiation needs as motivational determinants of perceived in-group and out-group homogeneity", *Journal of Experimental Social Psychology*, Vol. 37 No. 4, pp. 341-348.
- Preece, J., Nonnecke, B. and Andrews, D. (2004), "The top five reasons for lurking: improving community experiences for everyone", *Computers in Human Behavior*, Vol. 20 No. 2, pp. 201-223, available at: <https://doi.org/10.1016/j.chb.2003.10.015>
- Rainie, H. and Wellman, B. (2012), *Networked: The New Social Operating System*, MIT Press, Cambridge, MA.
- Ren, Y., Kraut, R. and Kiesler, S. (2007), "Applying common identity and bond theory to design of online communities", *Organization Studies*, Vol. 28 No. 3, pp. 377-408.
- Ren, Y., Harper, F.M., Drenner, S., Terveen, L.G., Kiesler, S.B., Riedl, J. and Kraut, R.E. (2012), "Building member attachment in online communities: applying theories of group identity and interpersonal bonds", *MIS Quarterly*, Vol. 36 No. 3, pp. 841-864.
- Rubenstein, E.L. (2012), "'Things my doctor never told me': bridging information gaps in an online community", *Proceedings of the American Society for Information Science and Technology*, Vol. 49 No. 1, pp. 1-10.
- Saracevic, T. (1996), "Modelling interaction in information retrieval (IR): a review and proposal", *Proceedings of the ASIS Annual Meeting, Vol. 33, Baltimore, MD, October 21-24*, pp. 3-9.
- Saracevic, T. (1997), "The stratified model of information retrieval interaction: extension and applications", *Proceedings of the Annual Meeting-American Society for Information Science, Vol. 34, Learned Information*, pp. 313-327.
- Savolainen, R. (2008), "Source preferences in the context of seeking problem-specific information", *Information Processing & Management*, Vol. 44 No. 1, pp. 274-293.
- Savolainen, R. (2009), "Small world and information grounds as contexts of information seeking and sharing", *Library & Information Science Research*, Vol. 31 No. 1, pp. 38-45.
- Savolainen, R. (2010), "Source preference criteria in the context of everyday projects: relevance judgments made by prospective home buyers", *Journal of Documentation*, Vol. 66 No. 1, pp. 70-92.
- Savolainen, R. and Kari, J. (2004), "Placing the Internet in information source horizons: a study of information seeking by Internet users in the context of self-development", *Library & Information Science Research*, Vol. 26 No. 4, pp. 415-433.
- Schatell, D., Wise, M., Klicko, K. and Becker, B.N. (2006), "In-center hemodialysis patients' use of the internet in the United States: a national survey", *American Journal of Kidney Diseases*, Vol. 48 No. 2, pp. 285-291.

- Shibutani, T. (1955), "Reference groups as perspectives", *American Journal of Sociology*, Vol. 60 No. 6, pp. 562-569.
- Smith, E.R., Murphy, J. and Coats, S. (1999), "Attachment to groups: theory and measurement", *Journal of Personality and Social Psychology*, Vol. 77 No. 1, pp. 94-110.
- Sonnenwald, D.H. (1999), "Evolving perspectives of human information behavior: contexts, situations, social networks and information horizons", in Wilson, T. and Allen, D. (Eds), *Exploring the Contexts of Information Behavior: Proceedings of the Second International Conference in Information Needs*, Taylor Graham, London, pp. 176-190.
- Sonnenwald, D.H. and Wildemuth, B.M. (2001), "Investigating information seeking behavior using the concept of information horizons", *The New Review of Information Behavior Research*, Vol. 2, pp. 65-86.
- Strauss, A. (1978), "A social world perspective", *Studies in Symbolic Interaction*, Vol. 1, pp. 119-128.
- Strauss, A.L. and Corbin, J.M. (1990), *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*, Sage Publications Inc., Newbury Park, CA.
- Suitor, J.J., Keeton, S. and Pillemer, K. (1995), "When experience counts: the effects of experiential and structural similarity on patterns of support and interpersonal stress", *Social Forces*, Vol. 73 No. 4, pp. 1573-1588.
- Unruh, D.R. (1979), "Characteristics and types of participation in social worlds", *Symbolic Interaction*, Vol. 2 No. 2, pp. 115-130.
- Unruh, D.R. (1980), "The nature of social worlds", *Sociological Perspectives*, Vol. 23 No. 3, pp. 271-296.
- van den Boer, Y., Arendsen, R. and Pieterse, W. (2016), "In search of information: Investigating source and channel choices in business-to-government service interactions", *Government Information Quarterly*, Vol. 33 No. 1, pp. 40-52.
- Volkman, J.E., Luger, T.M., Harvey, K.L., Hogan, T.P., Shimada, S.L., Amante, D., McInnes, D.K. et al. (2014), "The National Cancer Institute's Health Information National Trends Survey [HINTS]: a national cross-sectional analysis of talking to your doctor and other healthcare providers for health information", *BMC Family Practice*, Vol. 15 No. 111.
- Walker, D. and Myrick, F. (2006), "Grounded theory: an exploration of process and procedure", *Qualitative Health Research*, Vol. 16 No. 4, pp. 547-559.
- Winterbottom, A., Bekker, H.L., Conner, M. and Mooney, A. (2012), "Choosing dialysis modality: decision making in a chronic illness context", *Health Expectations*, Vol. 17 No. 5, pp. 710-723.
- Woudstra, L., van den Hooff, B. and Schouten, A. (2015), "The quality versus accessibility debate revisited: a contingency perspective on human information source selection", *Journal of the Association for Information Science and Technology*, Vol. 67 No. 9, pp. 2060-2071.
- Woudstra, L., van den Hooff, B. and Schouten, A.P. (2012), "Dimensions of quality and accessibility: selection of human information sources from a social capital perspective", *Information Processing & Management*, Vol. 48 No. 4, pp. 618-630.
- Zhang, Y. and Wildemuth, B.M. (2009), "Qualitative analysis of content", in Wildemuth, B.M. (Ed.), *Applications of Social Science Research Methods to Questions in Information and Library Science*, Libraries Unlimited, Westport, CT, pp. 308-319.
- Zimmer, J.C., Henry, R.M. and Butler, B.S. (2007), "Determinants of the use of relational and nonrelational information sources", *Journal of Management Information Systems*, Vol. 24 No. 3, pp. 297-331.
- Zipf, G.K. (1949), *Human Behavior and the Principle of Least Effort*, Vol. XI, Addison-Wesley Press, Oxford.

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